

### **Concepts of Perception:**

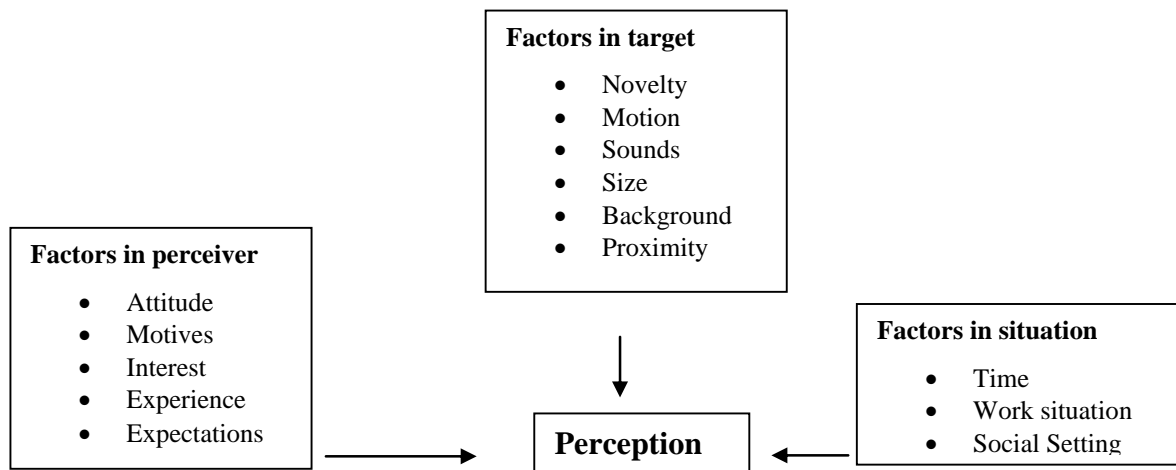
*Perception is the **meaningful interpretation of sensory information**. In other words perception is the process through which we select, organize and interpret sensory information.* According to Fernald and Fernald(2001) "Perception is the process by which we come to understand our surroundings."

Thus perception is a highly individualized psychological process that helps an organism in organizing and interpretation the complex patterns of sensory stimulation for giving them the necessary meaning to initiate his behavioral response.

### **Sensation Vs perception**

The primary difference is that sensation can be thought of as an organisms' first encounter with a raw sensory stimulus, whereas perception is the process by which the stimulus is interpreted, analyzed and integrated with other sensory information. Both sensation and perception are necessary for transforming the physical world into our psychological reality.

## **FACTORS THAT INFLUENCE PERCEPTION**



## **PERCEPTUAL ORGANIZATION**

Perceptual organization focuses on what takes place in the perceptual process once the information from the situation is received. The phenomenon of perceptual organization was first studied properly by a group of German psychologists known as the Gestaltists. Notable among these psychologists were Max Wertheimer, Koffka and Kohler. The word Gestalt coming from German, means configuration, totality or whole. Gestalt psychologists tried to study perception in terms of Gestalts or wholes.

The Gestaltists discovered over hundred principles or laws concerning the perceptual organization. Some of the principles of perceptual organizations are

### **1. The Principle of Figure-ground Relationship**

According to this principle, a figure is perceived in relationship to its background. In other words the principle of figure-ground states that part of stimulus appears to stand out as an object (or figure) against a less prominent background (or ground). Figures tend to have a distinct shape, to be more solid and substantial and to be in front of the ground. Boundaries seem to belong to the figure rather than to the ground which is seen as formless. Gestalt psychologists assert that even in the early age, the mother's figure will be perceived as a unit and as different from the background like the walls, the chair, table etc. In the opinion of the Gestalt psychologists the most primitive perception is only Figure and Ground Perception.

### **2.Principle of Closure**

According to this principle, while confronting an incomplete pattern, one tends to complete or close the

For example, the lines in the Fig (2) may be well perceived as the letter W and A. This type of organization is extremely helpful in making valuable interpretation of various incomplete objects, patterns or stimuli present in our environment.



Fig.2 Closure

### 3.Principle of Similarity

On the basis of similarity, objects or stimuli that look alike are usually perceived as a unit. A group of dots, triangles and circles that are similar in nature will be perceived each as a unit or group than the dissimilar ones. The greater the similarity, the higher is the chance to perceive it as a part of a group. For example in Fig (3) vertical rows of black dots and blank (white) dots may be seen to form separate groups in terms of their perception.

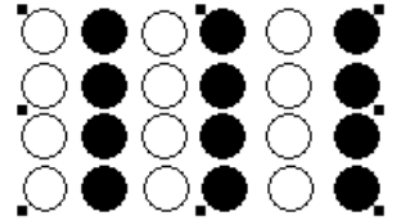
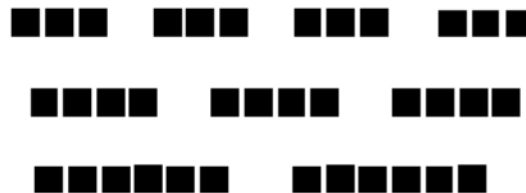


Fig.3 Similarity

### 4. Principle of Proximity



Those stimuli which are nearer to each other are likely to be perceived as one whole pattern from other stimuli which have a distance between them.

E.g. in Fig (4) 12 cubes

grouped in proximity appear as a whole pattern of 3, 4 or 2 (see right figure) according to proximity of cubes.

Fig.4 Proximity

5. Principle of Continuity On continuity basis, the objects or stimuli are perceived as a unit or group on the basis of their continuity. For example Fig. (5) while following the basis of continuity, the perception is organized by selecting the dot c or d instead or breaking the continuity by selecting b or a. It explains why our attention is being held more by continuous patterns rather than discontinuous ones.

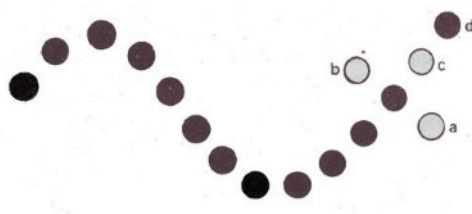


Fig 5. Continuity

### 6. The principle of simplicity

According to this Gestaltian principle, we tend to interpret our sensory stimulation so that we can perceive complex patterns in terms of simpler shapes. The characteristic like symmetry, curves, compact areas and the perceiver's familiarity with the figure all may contribute the whole from some of its parts.

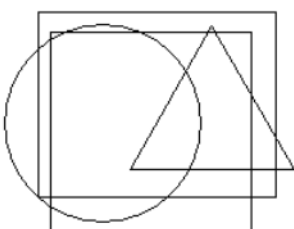


Fig.6 Simplicity

*In the adjacent figure, instead interpreting it as a complicated figure we tend to perceive a whole figure in simpler forms like squares, circles and triangles instead of small parts contributing in their formation.*

### 7. The principle of common fate

The principle of common fate relies on movement. The law of common fate states that elements that move in the same direction will be perceived as belonging together and forming a figure. In Fig (7) we can see the dots represented by arrows of same direction are perceived as a group or moving toward the same direction than the dots represented by the arrows of opposite direction.

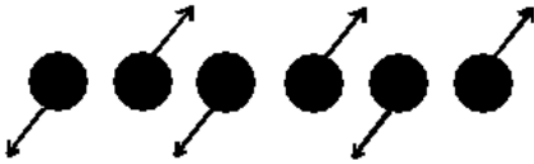


Fig.7 Common Fate

### 8. The principle of good figure

The principle of good figure that there is a tendency to organize things to make a balanced figure that includes all the parts. In Fig (6), such a balanced figure can be achieved only by using all the dots and rings to perceive a six pointed star. The law of good figure wins out over the law of similarity because the rings by themselves or the dots by themselves do not form good figures.

## **PERSON PERCEPTION**

Person perception is concerned with how the individuals understand and try to explain others behaviors.

### ATTRIBUTION THEORY

**Attribution theory explains how we identify the causes of our own behaviors and that of other people.**

The attribution theory was at first proposed by Fritz Heider in 1958. According to Heider all behaviors are determined by either internal or external factors or attributions.

### **INTERNAL AND EXTERNAL ATTRIBUTIONS**

Attributions can be made to

- An internal source of responsibility (something within the individual's control) or
- an external source (something outside the individual's control).

For instance if a student performs well in his exam and he thinks it is because he is smart and studied hard, it is internal attribution. If someone thinks that he performed well because the question paper was easy, that is external attribution.

### KELLEY'S ATTRIBUTION THEORY

Harold Kelley extended attribution theory proposed by Heider and proposed that people use 3 types of information to arrive at either a personal (internal) or situational (external) **attribution**. We form attributions based on whether these cues are low or high. These three cues are -

1. **Consensus:** Information regarding the extent to which behavior by one person is shown by others as well - do other people act the same way with the stimulus?
2. **Consistency:** Information regarding the extent to which a specific person shows similar behavior to a given stimulus across time - does the person act the same way with the stimulus at other times?
3. **Distinctiveness:** Information regarding the extent to which a given person reacts in the same manner to different stimuli or situations - does the person act the same way with other stimuli?

*When consensus and distinctiveness are low but consistency is high, we tend to attribute others'*

Example: If a staff (Hari) criticizes his boss, depending on these three cues we attribute this cause to either internal factor of Hari or external factor (environment or the boss himself). For instance many other staff also criticize the boss (high consensus), Hari criticizes the boss at other times too (high consistency) and Hari does not normally criticize other executives (high distinctiveness) – then the attribution is external (something to do with the boss himself not Hari). Similarly if no other staff criticize the boss (low consensus), Hari criticizes the boss at other times too (high consistency) and he criticizes other executives too very frequently (low distinctiveness) then Hari's behavior is attributed to internal cause (it is something about criticizing behavior of Hari himself).

## **Errors or biases in attribution**

### **FUNDAMENTAL ATTRIBUTION ERROR**

When we make judgments about the behavior of other people, we have a **tendency to underestimate the influence of external factors and overestimate the influence of internal or personal factors. This is called the fundamental attribution error.** This is why a sales manager is prone to attribute the poor performance of her sales agents to laziness rather than to the innovative product line introduced by a competitor. There is also a **tendency for individuals to attribute their own successes to internal factors such as ability or effort while putting the blame for failure on external factors such as luck. This is called the self-serving bias.** This is why a student blames teacher for failure and his own effort for success. The self-serving bias can cause of much interpersonal friction. It leads individual to perceive that while their own success stem from internal cause and are well deserve, the success of other stem from external factors and are less merited.

### **FREQUENTLY USED SHORTCUTS IN JUDGING OTHERS**

Perceiving and interpreting what others do is burdensome. So very frequently we use shortcuts in judging others. These techniques are frequently valuable as they allow us to make accurate perceptions rapidly and provide valid data for making predictions. They however can get us into trouble. Some of the frequently used shortcuts in judging others are:

#### **1. STEREOTYPING**

**Stereotyping means judging someone on the basis of one's perception of the group to which that person belongs.** In organizations, we frequently hear comments that represent stereotypes based on gender, age, race, ethnicity, and even weight: *"Women won't relocate for a promotion"; "Men aren't interested in child care"; "Older workers can't learn new skills";* etc. From a perceptual standpoint, if people expect to see this stereotype, that is what they will perceive, whether they are accurate or not.

#### **2. THE HALO EFFECT**

**Drawing a general impression about an individual on the basis of a single characteristic is called the Halo effect.** Halo is often discussed in performance appraisal when a rater makes an error in judging a person's total personality and/or performance on the basis of a single positive trait such as intelligence, appearance, dependability, or cooperativeness. Whatever the single trait is, it may override all other traits in forming the perception of the person. *For example, a person's physical appearance or dress may override all other characteristics in making a selection decision or in appraising the person's performance.* The opposite is sometimes called the "horns effect" where an individual is downgraded because of a single negative characteristic or incident.

#### **3. SELECTIVE PERCEPTION**

**Selective perception is our tendency to choose information that supports our viewpoints while ignoring information that threatens our viewpoints.** We can't observe everything going on about us so we engage in selective perception according to our interests, background, experience, and attitudes. *for example, a*

*new sales contracts in the office. The sales manager may ignore the negative information, choosing to evaluate the salesperson only on contracts generated. The manager is exercising selective perception.*

#### **4. CONTRAST EFFECTS**

We don't evaluate a person in isolation. Our reaction to one person is influenced by other persons we have recently encountered who rank higher or lower on the same characteristics. **Evaluating person's characteristics that are affected by comparisons with other people recently encountered and who rank higher or lower on same characteristics is called contrast effect.** *An illustration of how contrast effects operate is an interview situation in which one sees a pool of job applicants. The candidate is likely to receive a more favorable evaluation if preceded by average applicants and a less favorable evaluation if preceded by strong applicants.*

#### **5. PROJECTION**

It's easy to judge others if we assume that they're similar to us. For instance, if you want challenge and responsibility in your job, you assume that others want the same. Or, you're honest and trustworthy, so you take it for granted that other people are equally honest and trustworthy. **This tendency to attribute one's own characteristics to other people is called projection.** Projection can distort perceptions made about others. People who engage in projection tend to perceive others according to what they themselves are like rather than according to what the person being observed is really like.

#### **SPECIFIC APPLICATIONS IN ORGANIZATIONS**

People in organizations are always judging each other. Managers must appraise their employees' performances. We evaluate how much effort our co-workers are putting into their jobs. These judgments have specific implication in organization. Some of the implications are

**Employment Interview** Employment interview is the major process to decide who is hired and who is rejected in an organization. But the evidence indicates that interviewers make perceptual judgments that are often inaccurate. In addition, agreement among interviewers is often poor; that is, different interviewers see different things in the same candidate and thus arrive at different conclusions about the applicant. Interviewers generally draw early impressions that become very quickly deep-rooted. If negative information is exposed early in the interview, it tends to be more heavily weighted than if that same information comes out later. Studies indicate that most interviewers' decisions change very little after the first four or five minutes of the interview. The employment interview is an important input into the hiring decision and the interviewer should recognize that perceptual factors influence who is hired and eventually the quality of an organization's labor force.

**Performance Expectations:** There is an impressive amount of evidence that demonstrates that people will attempt to validate their perceptions of reality, even when those perceptions are faulty. This characteristic is particularly relevant when we consider performance expectations on the job. Many times **our expectations about the people affect our interaction with them in such a way that our expectations are fulfilled.** This is called **self-fulfilling prophecy** or *Pygmalion effect*. In other words when one person inaccurately perceives a second person and the resulting expectations cause the second person to behave in ways consistent with the original perception this is called self fulfilling prophecy. E.g. *if a manager has an initial impression of an employee as having the potential to move up within the organization Chances are the manager will spend a great deal of time coaching and counseling the employee, providing challenging assignments and grooming the individual for success finally resulting in good performance of employee.*

**Performance Evaluation** The performance appraisal represents an assessment of an employee's work. Although the appraisal can be objective (*e.g., a salesperson is appraised on how many dollars of sales she generates in her territory*), many jobs are evaluated in subjective terms. But subjective measures are, by definition, judgmental and can be affected by the perceptual errors made by the evaluator. For instance – a manager might evaluate by projecting his/her own expectation and potential in evaluating the staff, hence using shortcut in perception. Hence the evaluators must be aware of possible perceptual errors while evaluating

**Employee Effort** An individual's future in an organization is usually not dependent on performance alone. In many organizations, the level of an employee's effort is given high importance. *Just as teachers frequently consider how hard you try in a course as well as how you perform on examinations, so often do managers.* An assessment of an individual's effort is a subjective judgment susceptible to perceptual distortions and bias. *It is true, as some claim, that "more workers are fired for poor attitudes and lack of discipline than for lack of ability, then appraisal of an employee's effort may be a primary influence on his or her future in the organization.*

**Employee Loyalty** Another important judgment that managers make about employees is whether or not they are loyal to the organization. *In some organizations, if the word gets around that an employee is looking at other employment opportunities outside the firm, that employee may be labeled as disloyal and so may be cut off from future advancement opportunity.* The issue is not whether organization are right in demanding loyalty but the issue is that many do, and that assessment of an employee's loyalty or commitment is highly judgmental. What is perceived as loyal by one decision maker may be seen as excessive conformity by another. *An employee who questions a top management decision may be seen as disloyal by some, yet caring and concerned by other. Thus the individuals who report unethical practice by their employer to outsiders which in fact is a typically act out of loyalty to their organization but are perceived by management as trouble makers.*

## SOCIAL BEHAVIOR

Social behavior is the behavior directed toward society or taking place between members of the society. Social behavior includes interaction among people and their thinking toward others. Social behavior encompasses our attitudes, prejudiced thinking, our efforts to influence others and accepting others influence.

### Attitude:

Attitude is an enduring pattern of evaluative response toward a person, object or issue. Attitude can also be defined as a hypothetical construct that represents an individual's degree of like or dislike for an object. Attitudes are generally positive or negative. Attitudes are important because many times attitudes strongly influence social thought and behavior. For example if we have negative attitude toward some political party it is likely that we will vote against the party in election.

### How attitudes are formed:

Different psychologists have stressed different routes of development of attitudes. Some psychologists believe (*Like Pavlov*) that attitudes are developed when initially neutral stimulus acquires the capacity to evoke (or produce) reactions through repeated pairing with another stimulus. Many studies indicate that when initially neutral words are paired with stimuli that elicit strong negative reactions for example electric shocks or loud noise the neutral words acquire capacity to elicit favorable or unfavorable reactions representing our attitudes to neutral words.

Other psychologists (like Skinner) believe that attitudes are formed because of the rewards and punishment associated with the responses. For instance – we are frequently rewarded by our parents, teachers or friends for expressing the "correct" views they hold. Thus, the attitudes we have are the reinforced responses, according to this viewpoint.

Other psychologists believe that attitudes are formed due social learning or observational learning. Many times, our attitudes are formed merely by observing or imitating other's attitudes or behavior. Some other studies have also outlined the role of genetics in development of attitudes.

### Persuasion:

Persuasion is the process through which one or more persons attempt to alter the attitudes of one or more others. It is the process of guiding people and oneself toward the adoption of an idea, attitude, or action by rational and symbolic (though not always logical) means. Many times others are trying to

information in magazine, television that attempt to persuade us and many times they are able to do so. Persuasion is thus very important social behavior.

### **Approaches to persuasion:**

#### **1) Traditional Approach:**

- 2) **Cognitive approach:** Cognitive approach is the one that attempts to understand persuasion by identifying the cognitive processes that play a role in its occurrence. One of the cognitive models in persuasion is elaboration likelihood model. This model suggests that persuasion can occur in either of three two distinct ways differing in the amount of cognitive effort or elaboration they require.
  - i) First route i.e. central route in which attitude change results from systematic processing of information presented in persuasive message.
  - ii) Second route: Peripheral route in which attitude change results in response to persuasion cues such as the attractiveness, expertise, or status of would-be persuaders.
- 3) **Cognitive Dissonance theory:** According to this theory we experience the motivation to reduce cognitive dissonance. Cognitive dissonance is an unpleasant state that results when we notice inconsistency between two or more of our attitudes or between our attitudes and behaviors. This attempt to reduce inconsistency becomes a source of persuasion.

### **Prejudice:**

A prejudice is a preconceived belief, opinion, or judgment toward a group of people or a single person because of race, social class, gender, ethnicity, sexual orientation, age, disability, political beliefs, religion, line of work or other personal characteristics. In simple words prejudice is negative attitude toward members of specific social group. Prejudice is a very common social phenomenon in the society like ours. Prejudice is very harmful because prejudice almost always leads to negative action i.e. discrimination.

***Origin of prejudice:*** Prejudice results due to various reasons. Some of the reasons of prejudice are outlined here.

1. ***Direct intergroup conflict:*** Direct intergroup conflict arising due to the competition is one important source of prejudice. This phenomenon is explained by realistic group conflict theory of prejudice. According to this view prejudice stems from competition among social groups over valued commodities or opportunities. Due to the competition members of groups come to view others in negative terms and this in turn leads to prejudice. This notion has been supported by an experiment of Serif (?????????)
2. ***Social Categorization:*** Another source of prejudice is social categorization. Prejudice originates because we tend to divide the social world into two distinct category- us Vs them. Sharply contrasting feeling and beliefs are usually attached to members of one's in-group (Us) and to members of out group (Them group). Persons in group are viewed as favorable while those in out groups are viewed in negative terms. This becomes the source for prejudice.
3. ***Other Factors:*** Social learning, operant conditioning and classical conditioning also work as sources of prejudice. (same as for attitude)

### **Techniques for reducing prejudice:**

1. **Direct intergroup contact:** Frequent contact between different groups may work as a measure to reduce prejudice. This fact has been put forward by contact hypothesis which suggests that contact between members of various social groups can be effective in reducing prejudice between them. This is applicable only when contact takes place in favorable situation.
2. **Recategorization:** Recategorizing 'us' and 'them' groups can be effective measure for reducing prejudice between them. Prejudice develops because of our negative feeling toward the member of out group. If we can broaden the horizon of us group and can put members of them group to

adults who serve as models for children from providing training on prejudice it can be reduced to a large extent.

4. Other approaches: Other approaches for reducing prejudice include applying cognitive dissonance for attitude change and encouraging co-operation rather than competition.

## Social influence:

Consider the number of radio and television commercials, magazine and newspaper ads or number direct requests from people that we encounter each day: all involve efforts to influence us in some manner. Every moment people are trying to influence the attitudes, opinions and behaviors of each other. This attempt to influence is known as social influence.

Social influence is thus any process whereby a person's attitudes, opinions, beliefs or behaviors are altered or controlled by some form of social communication. Social influence can also be defined as the effort by one or more individuals to change the attitudes, perception or behaviors of one or more others. It includes conformity, compliance, obedience, minority social influence etc.

### Conformity:

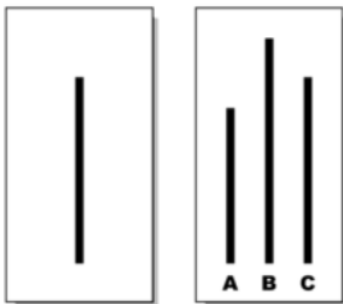
Have you ever shown any behavior only because many people are showing such behavior? If it is so, you are showing conformity. Conformity can be defined as adjusting one's behavior or thinking to match those of other people or a group standard. In other words it is a type of social influence in which individuals change their attitudes or behaviors in order to adhere to existing social norms. Conformity may be the result due to subtle unconscious influences, sense of security or direct and overt social pressure. Human beings show strong conformity in social influence.

#### Asc's experiment on conformity:

Experiments led by Solomon Asch asked groups of students to participate in a "vision test." In reality, all but one of the participants was partner (confederates) of the experimenter, and the study was really about how the remaining student would react to the confederates' behavior.

In the basic Asch experiment, the participants — the real subject and the confederates — were all seated in a classroom. They were asked a variety of questions about the lines such as how long is A, compare the length of A to an everyday object, which line was longer than the other, which lines were the same

length, etc. The group was told to announce their answers to each question out loud. The confederates always provided their answers before the study participant, and always gave the same answer as each other. They answered a few questions correctly but eventually began providing incorrect responses.



Nearly 75 percent of the participants in the conformity experiments went along with the rest of the group at least one time. After combining the trials, the results indicated that participants conformed to the incorrect group answer approximately one-third of the time. In order to ensure that participants were able to accurately gauge the length of the lines, participants were asked to individually write down the correct match. According to these results, participants were very accurate in their line judgments, choosing the correct answer 98 percent of the time. The experiments also looked at how the number of group members impacts conformity. When just one other confederate was present, there was virtually no impact on participants' answers. The presence of two confederates had only a tiny effect. The level of conformity seen with three or more confederates was far more significant.

Asch also found that having one of the confederates give the correct answer while the rest of the confederates gave the incorrect answer dramatically lowered conformity. In this situation, just five to



finding (Morris & Miller, 1975), suggesting that having social support is an important tool in combating conformity. This experiment illustrates our tendency to conform to group behavior.

### Some factors that affect the degree of conformity:

Following factors may affect the degree of conformity.

**Group size:** Conformity increases with increase in group size. However, if group is very large conformity may decrease.

**Group cohesion:** Cohesion is the degree of attraction or oneness between group members. Conformity increases with the increase in group cohesion.

**Descriptive and injunctive norms:** Descriptive norms are the ones indicating what most people do in given situation. Injunctive norms specify what ought to be done- what is approved or disapproved behavior in given situation. These norms, to large extent influence conformity.

### **Compliance:**

Compliance is a form of social influence in which one or more person accept direct request from others. In other words, it refers to the act of responding favorably to an explicit or implicit request offered by others. The request may be explicit, such as a direct request for donations, or implicit, such as an advertisement promoting its products without directly asking for purchase. In all cases, the target recognizes that he or she is being urged to respond in a desired way.

There are various tactics in compliance. Some of them are Ingratiation, Foot in the door technique and Door in the face technique.

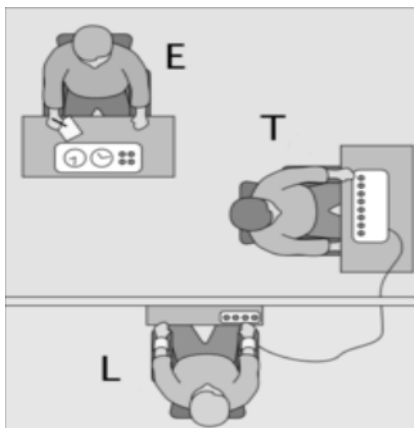
- **Ingratiation** is a technique of social influence based on inducing increased liking in the target person before influence is attempted.
- **Foot in the door technique** is a technique for gaining compliance in which a small request is followed by a larger one.
- **Door in the face** is a technique for gaining compliance in which a large request is followed by a smaller one.

*(give examples for each technique)*

### **Obedience:**

It is a form of social influence in which one individual issues orders to another to behave in specific way and other one follows it. In other words, Obedience is a form of social influence where an individual acts in response to a direct order from another individual, who is usually an authority figure. It is assumed that without such an order the person would not have acted in this way.

**Milgram's Experiment:** Social psychologist Stanley Milgram researched the effect of authority on obedience. He concluded people obey either out of fear or out of a desire to appear cooperative even when acting against their own better judgment and desires. Milgram's classic yet controversial experiment illustrates people's reluctance to confront those who abuse power.



In the experiment respondents were told that the experiment would study the effects of punishment on learning ability. They were offered a token cash award for participating. Although respondents thought they had an equal chance of playing the role of a student or of a teacher, the process was fixed so all respondents could only play the role of teacher. The learner was an actor working as a cohort of the experimenter.

"Teachers" were asked to administer increasingly severe electric

to each teacher. This was done to give teachers a feeling for the jolts they thought they would be discharging. Shock levels were labeled from 15 to 450 volts.

In response to the supposed jolts, the "learner" (actor) would begin to grunt at 75 volts; complain at 120 volts; ask to be released at 150 volts; plead with increasing vigor, next; and let out agonized screams at 285 volts. Eventually, in desperation, the learner was to yell loudly and complain of heart pain. At some point the actor would refuse to answer any more questions. Finally, at 330 volts the actor would be totally silent-that is, if any of the teacher participants got so far without rebelling first. Teachers were instructed to treat silence as an incorrect answer and apply the next shock level to the student. If at any point the innocent teacher hesitated to inflict the shocks, the experimenter would pressure him to proceed. Such demands would take the form of increasingly severe statements, such as "The experiment *requires* that you continue."

What do you think was the average voltage given by teachers before they refused to administer further shocks? What percentage of teachers, if any, do you think went up to the maximum voltage of 450?

*Results from the experiment:* Some teachers refused to continue with the shocks early on, despite urging from the experimenter. This is the type of response Milgram expected as the norm. But Milgram was shocked to find those who questioned authority were in the minority. Sixty-five percent (65%) of the teachers were willing to progress to the maximum voltage level. Participants demonstrated a range of negative emotions about continuing. Some pleaded with the learner, asking the actor to answer questions carefully. Others started to laugh nervously and act strangely in diverse ways. Some subjects appeared cold, hopeless, somber, or arrogant. Some thought they had killed the learner. *Nevertheless, participants continued to obey, discharging the full shock to learners.*

In general, more obedience was elicited from "teachers" when (1) the authority figure was in close proximity; (2) teachers felt they could pass on responsibility to others; and (3) experiments took place under the auspices of a respected organization.

Participants were debriefed after the experiment and showed much relief at finding they had not harmed the student. One cried from emotion when he saw the student alive, and explained that he thought he had killed him. But what was different about those who obeyed and those who rebelled? Milgram divided participants into three categories:

*Obeded but justified themselves.* Some obedient participants gave up responsibility for their actions, blaming the experimenter. If anything had happened to the learner, they reasoned, it would have been the experimenter's fault. Others had transferred the blame to the learner: "He was so stupid and stubborn he deserved to be shocked."

*Obeded but blamed themselves.* Others felt badly about what they had done and were quite harsh on themselves. Members of this group would, perhaps, be more likely to challenge authority if confronted with a similar situation in the future.

*Rebelled.* Finally, rebellious subjects questioned the authority of the experimenter and argued there was a greater ethical imperative calling for the protection of the learner over the needs of the experimenter. Some of these individuals felt they were accountable to a higher authority.

# Emotion

The term emotion is derived from Latin word *emovere* the meaning of which is to move. . Emotion has been defined by various psychologists in different ways. According to Sdorow (1995) 'Emotion is a motivated state marked by physiological arousal, expressive behavior and mental experience.' According to Robbins, emotions are intense feelings that are directed at someone or something. Despite the difference in definition, psychologists have come to common agreement that emotion consists of three components-

1. Physiological changes within body i.e. changes in heart beat, pulse rate etc.
2. Subjective experience i.e. personal experience which differs from individual to individual and
3. Expressive behaviors i.e. running, weeping etc.

## **Affect, emotions and moods:**

**Affect** is general term that covers a broad range of feelings that people experience. Affect encompasses both emotion and mood.

**Emotions** are intense feelings that are directed at someone or something.

**Moods** are feelings that tend to be less intense than emotions and that lack a contextual stimulus. Emotions are moods when they lack focus on contextual object. For example, if someone scolds you and you get angry with him this is emotion. However, if you feel upset all over day this is mood.

## **Emotional Labour- Felt Vs Displayed emotions:**

**Felt emotions** are individuals actual emotions. They are spontaneous and true emotions or subjective experience of the individual, which might or might not be expressed exactly outside.

**Displayed emotions** are those emotions that are the emotions expressed outside which are organizationally required and considered appropriate in given job. Displayed emotions may or may not be congruent with felt emotions. Sometimes individuals mask their felt emotions. If one goes to funeral he shows sadness though he may be indifferent to the death.

Similarly a salesperson has to show cheerful face even though s/he is not happy from inside. **Emotional labor** refers to the effort, planning and control need to express organizationally desired emotions during interpersonal transactions (Morris & Feldman, 1996). Emotional labor forces an individual to follow 'display rules' of emotional expression in the society or work setting and restrain the expression of actual emotion according to time and situation.

## **Emotional dimensions**

There are various emotions and emotions may vary in the intensity and frequency too.

### ***Types of Emotion***

There are a number of emotions. They include anger, enthusiasm, envy, fear, surprise, sadness etc. These emotions can be broadly divided into positive and negative emotions. Positive emotions express a favorable evaluation or feeling. E.g. happiness, hope. Negative emotions express a negative evaluation or unpleasant feeling. E.g. hate, anger. Negative emotions have great impact in individual's behavior compared to positive emotions.

Though there are a number of emotions, there are six basic or fundamental emotions. They are anger, fear, sadness, happiness, disgust and surprise. All other emotions are supposed to be combination of these basic emotions.

### ***Intensity***

The intensity or strength of expression of emotions depends partly on individual differences and partly on the role given to them in organization. Demand of job of an individual plays important role in his expression of emotion. The individual working in television programme are supposed to show more intense emotion compared to individuals working as air traffic controller.

by employees. So, whether an employee can successfully meet the emotional demands of a given job depends not only upon what emotions need to be displayed and their intensity, but also on how frequently and for how long the effort has to be made.

## **External constraints on emotion:**

Every organization defines boundaries that identify which emotions are acceptable and the degree to which they can be expressed. Similarly, every culture has its own boundaries regarding appropriateness of emotions. These and other external constraints play important role in shaping displayed emotions and to some extent felt emotion.

Organizational influence and cultural influence are described below.

### **1. Organizational influences:**

Every organization has its own boundaries regarding appropriateness of emotion and emotional expression. Smiling and happy appearance may be the emotions appropriate for one organization and enthusiasm, sincerity may be appropriate in another organization. For the individuals working in any amusement related organization smiling is face and happy mood is a must which is not same for the organization related to defense services. Similarly, the emotions that are appropriate in sports may not be acceptable to work setting. Thus, appropriateness of emotional expression as defined by an organization affects displaying of emotions and most of the emotions displayed by employee are shaped by organization they are working for.

### **2. Cultural influences:**

Emotional expression may also be shaped by cultural influences. Various cultural norms define appropriateness of emotion in their own way. For example, cultural norms in U.S.A. dictate that employees in service organization should smile and act friendly when interacting with customers. In Israel, cashier is encouraged to look somber or serious. In Muslim cultures, smiling is frequently taken as a sign of sexual attraction. The emotions appropriate in western cultures may not be appropriate in our culture.

Thus, cultural factors influence what is or isn't considered as emotionally appropriate. What is acceptable in one culture may seem extremely unusual in another. Culture influence is thus one crucial factor in shaping displayed emotions and felt emotions to some extent.

## **Emotion and organization:**

Concept of emotion is very applicable to organizational settings. State of emotion is very essential in **job satisfaction** and **employees performance** in job setting. Understanding of emotion can **improve** our ability to explain and predict the selection process in organization, decision making, leadership, interpersonal conflict, customer services, and deviant work place behavior. The relation of emotions to these different components of organization is explained below.

### **Ability and selection:**

Success of an organization depends on selecting appropriate manpower and manager's ability to manage his employees. Person **who can read own and others emotions has found to be a good performer**. This is called **EI** (emotional intelligence)

EI enables us to **cope with stress and pressures**. EI is a factor in selection of employees. EI is composed of **five dimensions**

- Self-awareness (what you're feeling)
- Self-management (manage the feelings)
- Self-motivation (go on with -ve emotions)
- Empathy (feel how others are feeling)
- Social skills (handle emotions of others)

**Decision making:** **Traditional approaches** to decision making in organization has emphasized rationality. They have ignored the role of anxiety; fear etc. The only thing that mattered was what was right. However,

stressed out than when they're calm. Negative emotions can result in a limited search for new alternatives and a less vigilant use of information. On the other hand, positive emotions can increase problem solving skills and creative thinking in decision making. Thus, when making decisions it is important to consider mind as well as heart for effective decision making.

### **Leadership:**

Leadership is the ability to lead group of people. Leadership quality is sought in every organization and emotional expression is one important characteristics of leadership.

Effective leaders usually rely on expression of feelings to help convey their messages because Expression of emotions in speeches is often critical element that results in individuals accepting or rejecting a leader. When leaders feel excited, enthusiastic, and active they may be more likely to energize their subordinates. If new visions are offered employees may be resistant to such vision. In such cases, effective leaders often evoke, frame and mobilize positive emotion in their subordinates. By arousing emotions and linking them to an appealing vision, leaders increase the likelihood that employees will accept changes. Thus, emotion is an integral component of leadership.

### **Interpersonal conflict:**

Many times there are conflicts in organization. Such conflicts badly affect employees' performance and may ultimately lead to negative outcomes for an organization. Because some emotional elements are always attached in conflicts rationality model of conflict resolution may not appropriately resolve conflict. A managers' ability to resolve thus conflicts largely depends upon his ability to identify emotional element in conflict. Thus, a manager should be able to assess the emotional component of conflict and should be able to make the conflicting groups work together again.

### **Customer services:**

Employees' emotional state to a large extent influences customer services which in turn influences customers' willingness to return to the place of business and the level of customer satisfaction. When employees express positive emotions, customers tend to respond positively and their willingness to return to the place is likely to increase. Negative emotions tend to have negative effect on customer. Thus, emotion also plays role in customers' services too.

### **Deviant work place behavior:**

Negative emotions can lead to a number of deviant work place behaviors. Deviant behaviors are the behaviors that violate the established norms of an organization and threaten the organization, its members or both. These deviant behaviors may range from violent behaviors (e.g. theft, destruction etc.) to non violent behaviors (E.g. leaving early, intentionally working slowly etc.). These behaviors may lead negative outcomes. Understanding of employees' can help reduce such behaviors. Thus, understanding and managing of emotion is also important in managing deviant work place behaviors.

In conclusion, it can be said that knowledge of emotion and emotion management is very important in organizational setting.

**INTELLIGENCE** - Individuals differ from each other in many respects. One of the major aspect in which individuals differ is intelligence. Intelligence is important ability of human beings. Irrespective of its importance, there exist differences in opinion regarding what intelligence is, its nature and meaning.

Some psychologists define intelligence as adjustment capacity of the individual to different situations and problems of life. Others define it as individual's ability to learn. Some other psychologists define intelligence as the ability of abstract thinking. These definitions have emphasized one or another aspect of intelligence. Therefore, other psychologists have tried to define intelligence with an attempt to include all aspects of intelligence. One of such attempt is made by David Wechsler. **Wechsler (1958) defined intelligence as the global capacity of the individual to act purposefully, to think rationally and to deal with the situation effectively.** This definition defined intelligence as total (global) ability that comprises learning ability, goal directed behavior with drives and incentives (purposefully), ability to think (rationally) and change behavior according to the situation (effectively). **According to Baron (2000), intelligence is the individual's ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning and to overcome obstacles by careful thought.**

### MAJOR APPROACHES OF INTELLIGENCE:

It is always a matter of controversy among psychologist whether intelligence comprises one characteristics or it involves several characteristics. Psychologists have analyzed the underlying components of intelligence. In this attempt, several theories have been evolved. Two influential theories are: 1) Two- Factor theory and 2) Group-factor theory

**1. Two factor theory of intelligence:** Proposed by Charles Spearman in 1927, this theory is also called g-factor theory. According to this theory, intelligence consists of two major factors: 1) general factor and 2) Specific factor

Performance on any cognitive task depends upon a general factor, or the general ability (g). According to Spearman, all individuals possess general factor. This factor is common to all mental activities - all intellectual tasks and mental abilities. People, while adjusting with different intellectual tasks employ it. For instance - Mechanical ability, musical ability, mathematical ability show a level of correlation because certain amount of g is required in them. *g differs among people and is relatively stable through time in a person.*

Spearman observed that a person does not do equally well in all types of intellectual acts. This variation in their ability to perform different tasks points out some other ability apart from the g. 'this ability other than the g required in performing a specific task is the **specific factor or specific ability/intelligence (s).** They are different specific skills required for specific fields. For example, mathematical skill, mechanical skill.

Spearman believed that specific factors tend to correlate among each other and with general factor. Thus, an individual who scores high in mathematical scale will also score high on verbal comprehension. I.Q. tests that give single score have used the concept of g factor theory.

**2. Group Factor theory of Intelligence:** Proposed by L.L. Thurstone in 1938 Group factor theory is also known as multifactor theory or theory of primary mental activities. According to this theory, intelligence is not one general factor but a small set of independent factors of equal importance. He called those factors as 'Primary mental abilities'.

According to this theory, intelligence is composed of seven primary mental abilities given below:

1. **Verbal Comprehension:** Is the ability to understand the meaning of words. It can be measured by tasks involving vocabulary, synonyms, antonyms, and reading comprehension.
2. **Word fluency:** Is the ability to think words rapidly. Verbal fluency can be measured by tasks requiring a rapid production of words, solving anagrams etc.
3. **Number:** Is the ability to work with numbers and perform numerical computation. This can be measured by giving problems like arithmetic.
4. **Space relation (Spatial visualization):** Is the ability to mentally visualize and manipulate objects in three dimensions. This ability can be measured by task requiring manipulation of geometrical design like block design.
5. **Memory:** Is the ability to remember words, letters, numbers and images. The recall of sentences, paired words etc. can be used to measure memory.
6. **Perceptual speed:** Is the ability to grasp visual details quickly and to see similarities and differences between pictured objects. Problems involving finding out missing things, differentiating between

7. **Reasoning:** Is the ability to derive general ideas and rules from specific information. Analogies and problems solving tasks can be used to measure reasoning ability.

Each of these primary mental abilities consists within it minute factors. Although these seven factors appear to be free and separate from each other, they correlate with each other. The correlation between these seven factors shows the existence of the 'g' factors, although Thurstone denied their existence.

### 3. Gardner's theory of Multiple Intelligence:

The theory of multiple intelligences was developed in 1983 by Howard Gardner, professor of education at Harvard University. This theory suggests that the traditional notion of intelligence, based on I.Q. testing, is far too limited. Instead, Gardner proposes eight different intelligences to account for a broader range of human potential in children and adults. Gardner argues that we have at a minimum eight different forms of intelligence, each relatively independent of the others. They are -

**Logical-mathematical intelligence** consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. In Gardner's words, it entails the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking.

**Musical intelligence** involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms. According to Gardner musical intelligence runs in an almost structural parallel to linguistic intelligence.

**Linguistic Intelligence** involves having a mastery of language. This intelligence includes the ability to effectively manipulate language to express oneself rhetorically or poetically. It also allows one to use language as a means to remember information.

**Bodily-kinesthetic intelligence** involves the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements. Gardner sees mental and physical activity as related.

**Spatial intelligence** involves the potential to recognize and use the patterns of wide space and more confined areas.

**Interpersonal intelligence** is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others. Educators, salespeople, religious and political leaders and counselors all need a well-developed interpersonal intelligence.

**Intrapersonal intelligence** involves the capacity to understand oneself, to appreciate one's feelings, fears and motivations. In Gardner's view it involves having an effective working model of ourselves, and to be able to use such information to regulate our lives.

**Naturalist intelligence** enables human beings to recognize, categorize and draw upon certain features of the environment. This ability enables us to identify and classify plants, animals and minerals and to use this information in activities such as framing. It 'combines a description of the core ability with a characterization of the role that many cultures value'

In Gardner's view, each of the multiple intelligences is linked to an independent system in brain. Furthermore, he suggests that there may be even more types of intelligence, such as existential intelligence, which involves identifying and thinking about the fundamental questions of human existence. Although the eight basic types of intelligence are presented individually, Gardner suggests that these separate intelligences do not operate in isolation.

### 4. Cattell's Fluid and Crystallized intelligence:

According to Cattell(1963) there are two different kinds of intelligence. Fluid Intelligence and Crystallized Intelligence. **Fluid intelligence is the ability to think and reason abstractly and solve problems.** Examples of the use of fluid intelligence include solving puzzles and coming up with problem solving strategies. In contrast, **Crystallized intelligence is the accumulation of information, skills and strategies that people have learned through experience and that they can apply in problem solving situations.** It reflects our ability to call up information from long term memory. We would be likely to rely on crystallized intelligence, for instance, reading comprehension and vocabulary exams.

In contrast to fluid intelligence, which reflects a more general kind of intelligence, crystallized

## 5. Sternberg's triarchic theory of intelligence:

This theory was proposed by Sternberg in 1984. According to this theory there are basically three basic types of human intelligence.

**Componential or analytic intelligence:** It is the ability to think critically and analytically. Componential intelligence refers to the information processing strategies that individual uses when he thinks. People high in this type of intelligence do score high in academic/ IQ tests. For instance – professors, or academically brilliant students.

**Experiential or creative intelligence:** It is the insight and the ability to formulate new ideas. People who score high on EI are strong thinking creatively and adjusting creatively and effectively to new situations. For instance – scientific geniuses and inventors like Einstein and Newton. People high on this intelligence are good at combining seemingly unrelated facts. This intelligence also reflects how an individual connects the internal world to external reality.

**Contextual or practical intelligence:** This involves the ability to grasp, understand and deal with everyday tasks. It is related with adapting to new situation or shaping environment. The people who score high in CI are practical and adaptive – also called 'Street Smart' people.

Sternberg also acknowledged that an individual is not restricted to having excellence in only one of these three intelligences. Many people may possess an integration of all three and have high levels of intelligence threefold.

## VARIATION IN INTELLECTUAL ABILITY:

Individuals differ in respect to level of intelligence. Some individuals secure high in intelligence test compared to others. If we plot the intelligence level in general population on graph, it seems somewhat like a bell shaped curve (or normal curve) with majority of population lying in average intelligence and very small portion of population lying in either of the extreme of intelligence (i.e. mental retardation and mental gifted). Such differences in intelligence account for people's ability to cope with the demand of society. Some people can cope with the demands of society effectively and can learn quickly while others may learn slowly. Though high level of intelligence may not guarantee good life, low intelligence may create enormous difficulties. *(Consult the normal curve for intelligence from course book or classroom note)*

### Mental retardation:

Mental retardation is defined as significantly sub average general intellectual functioning that is accompanied by significant limitation in adaptive function in certain skill areas such as self care, work, health and safety. An individual is said to be mentally retarded if the symptoms appear before the age of 18 and if I.Q. is below 70.

Mental retardation can be **categorized** into 4 major levels. They are 1) Mild mental retardation, 2) Moderate Mental retardation, 3) Severe mental retardation, and 4) Profound mental retardation *(dear students, you can simply remember the IQ differentiation as we did in class or refer to the table of types of mental retardation for further detail)*

**Causes:** Mental retardation can be the result of various factors. Some of the factors are described below:

**Genetic factors:** Genetic abnormalities can also cause mental retardation. For instance - Down's syndrome: is a form of mental retardation that occurs due to genetic factor. This is caused by presence of an extra chromosome in 21<sup>st</sup> pair. The extra chromosome may come from mother's egg or father's egg. The children with Down's syndrome have some or all of the following characteristics: Almond shaped eyes, small ears, short hands and neck, flat face, nose and back of head. Children with Down's syndrome are usually moderately retarded.

**Other factors:** -Inadequate nutrition, use of drugs or alcohol by expectant mothers.

-Infection, toxic agents, and traumas resulting from a lack of oxygen during birth.

**Education and treatment:** There is no cure for serious retardation but special training can produce great difference in personal, social and occupational adjustment.



individual comprise 2 % of general population. Though there is lack of common agreement in defining mental giftedness, many psychologists believe I.Q. above 140 sufficient to label giftedness.

These gifted individuals have high capacity of adjustment, are quick learner, and can solve the problems effectively.

But some researches have shown that gifted individuals do have problems in adjustment. A study by Hollingsworth (1942) revealed that many children with I.Q. above 180 were very poorly adjusted. Many of them were underachievers, and some were even suicidal. Often they are not fit for their peers because of high intellectual ability and with older ones because of physical features. So there may arise identity crisis. To address such problems of gifted individuals special schools have been established in many countries.

The mentally gifted have been studied in two ways. First, by studying their biographies in order to know the age at which they did the distinct tasks and second, by taking the children with higher I.Q. and follow them through life.

A monumental study of gifted children was conducted in the early 1920s and is still **going** on.

The study was started by Terman (1947), the creator of the Stanford–Binet Scale and Oden (1959) the study was conducted in California. Terman and his associates, after testing many thousands of children, aged 8 to 12 years, picked out for further study a group of more than 1,500 children who had I.Q. 140 or more. These children were followed and examined periodically over the next 60 years.

One interesting thing about them is the homes they came from. About third were the children of professional people, about half came from homes of the higher business classes, and only a small portion (7 percent) came from the working classes. This indicates a positive correlation between intelligence and socio-economic classes.

The second striking discovery of his studies is the latter success of the gifted children. About 700 people from the original study could be contacted 25 years later. 70 percent of these children completed graduate level study compared to 8 percent in the general population. As a group, they received more awards, earned higher incomes, contributed in arts and literature, hold responsible managerial positions, and received recognition for outstanding intellectual or professional achievements. They had collectively written more than 90 books, registered around 200 patents. Most of others were less outstanding but still much more successful than people of average intelligence.

However, some were conspicuously unsuccessful. Some had dropped out of school early and some became vocationally misfits. Comparisons had showed that personality factors made the difference.

Examples of Mentally Gifted personalities: The famous person in the history Francis Galton (scientist) is supposed to have I.Q. 200. John Stuart Mill (writer) and Johann Wolfgang von Goethe (poet) are supposed to have I.Q. above 180. Mill learned Greek when he was only 3 years old, algebra and geometry at age 8 and philosophy at age 12. William Woodsworth is supposed to have I.Q. 150.

### **Role of Heredity and Environment in Intelligence:**

There has always been a controversy regarding the role of heredity and environment in intelligence. Many researches have supported the role of heredity in intelligence while others emphasize on the role of environment.

#### Evidence in favor of Heredity:

A large number of the study of twins reared apart was undertaken by Thomas Bouchard of the University of Minnesota starting in 1979. He “collected” pairs of separated twins from all over the world and reunited them while testing their personalities and IQs. Other studies at the same time concentrated on comparing the IQs of adopted people with those of their adopted parents and their biological parents or their siblings. Put all these studies together, which include the IQ tests of tens of thousands of individuals, and the table looks like this:

Identical twins reared together, 86%

Identical twins reared apart 76%

Fraternal twins reared together 55%

Biological siblings reared together 47% (studies show that reared apart about 24%)

Parents and children living together 40%

Parents and children living apart 31%

Adopted children living together 0%

Unrelated people living apart 0%

Many studies conducted on identical and non-identical twins, blood relatives have shown strong influence of heredity on intelligence

Well-controlled adoption studies done in France have found that transferring an infant from a family having low socioeconomic status (SES) to a home where parents have high SES improves childhood IQ scores by 12 to 16 points or about one standard deviation, which is considered a large effect size in psychological research." (Wahlsten, 1997).

Several recent US studies have demonstrated improvements in children's IQ's by improving the lives of infants in disadvantaged circumstances. According to Wahlsten (1997) delays in schooling cause IQ to 'drop' 5 points per year. This emphasizes the role of schooling in intelligence. Severe malnutrition, before birth or during the early years of life, can limit neurological development and have a long-term impact on cognitive development and intelligence (Ricciuti, 1993). Some research studies have examined the effects of providing medically approved food supplements and vitamins to infants and young children who would not otherwise have adequate nutrition. Such interventions are most likely to enhance children's development of motor skills, but in some instances cognitive development is enhanced as well (Pollitt & Oh, 1994; Sigman & Whaley, 1998).

These evidences indicate that both nature and nurture influence intelligence. What is less clear is how much influence each of these factors has. But most psychologists now believe that it may ultimately be impossible to separate the relative effects of heredity and environment. They suggest that the two combine to influence individual's cognitive development and measured IQ in ways that we can probably never disentangle.

## Learning

The do's and don'ts of life, the socialization process, language development, development of basic values, knowledge regarding various aspects of life, all come through learning or training. The process of learning has, therefore, tremendous importance for the human beings and for some animals to live and exist. Without learning life becomes completely meaningless, capacity to adjust becomes nil.

Morgan and King (1978) have defined learning as "**any relatively permanent change in behavior which occurs as a result of practice and experience**".

Thus learning has three basic components:

(a) Learning is a change in behavior. The change may be positive (e.g. Learning to swim) or Negative (e.g. learning to smoke). In other words change in behavior may be for better or worse.

(b) It is a change that takes place through practice and experience. The changes in behaviors that are the result of growth, maturation, instincts, fatigue, illness and drugs are not learning.

(c) Before it can be called learning, the change must be relatively permanent; it must last a fairly long time, although how long a change must last can not be specified.

### **Theories of Learning (Different perspectives)**

#### **Behavioral Perspective**

Behavioral perspective of learning focuses on the observable behavior of organism. These approaches consider behavior as a function of external environmental conditions. According to these perspectives only external environmental conditions determine learning process. Classical conditioning and operant conditioning are two renowned theories follow behavioral perspective.

### **CLASSICAL CONDITIONING LEARNING (PAVLOVIAN CONDITIONING)**

Theory of Classical conditioning was outlined by Russian Psychologist Ivan Pavlov after his experiments on dog. ***Classical conditioning is a type of learning through which an initially neutral stimulus comes to elicit a particular response as a consequence of being repeatedly paired with an unconditioned stimulus.*** In other word it is a process in which an organism learns to respond in a particular way to a stimulus that previously did not produce that response. This type of learning is also called stimulus response (S-R) type of learning because the organism (or individual) is considered to be passive in learning process i.e. organism responds according to nature of stimulus.

#### **The experiment**

In one of his experiments, Pavlov kept a dog hungry for a few days and then tied him on to the experimental table that was fitted with certain mechanically controlled devices. The dog was made comfortable and distractions were excluded as far as it was possible to do. The observer kept himself hidden from view of the dog but was able to view the experiment by means of a set of mirrors. Arrangement was made to give food to the dog through automatic devices. Every time the food was presented to the dog, he also arranged for the ringing of a bell just before it. So after the bell was rung, the food was presented to the dog, there was automatic secretion of saliva from the mouth of the dog.

In this first trial bell alone did not bring saliva until food was not placed in its mouth. Only after the repetition of bell-food sequence for several days, when the dog could connect the bell with the food and anticipated food at the sound of bell, did it salivate to the bell only, even before seeing the food. It was found

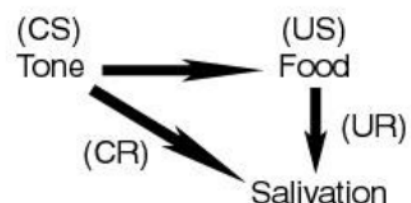
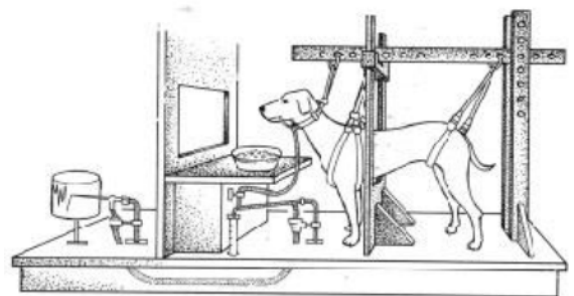
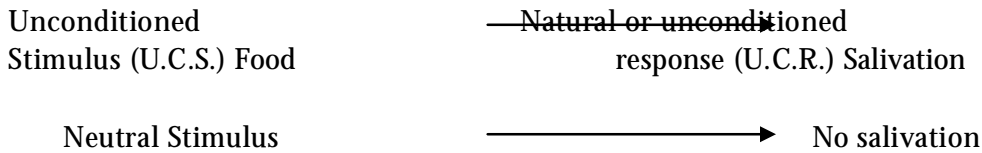


Fig. Classical Conditioning Experiment

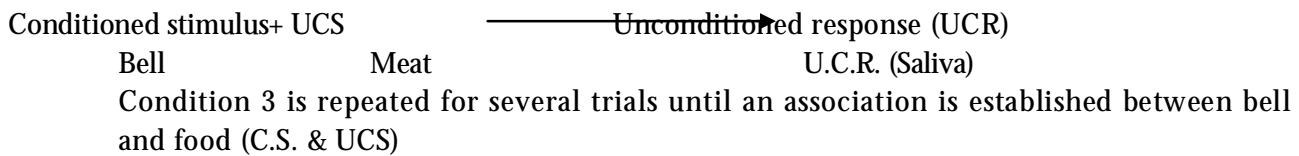
tioned or artificial stimulus is called classical conditioning process. Pavlov, in course of his many experiments, demonstrated that the dog can be made to salivate to any stimulus, however unnatural and irrelevant it may be. This discovery of Pavlov made a significant contribution to learning theory.

Pavlov's classical conditioning can be explained by the following pattern, which Pavlov used in his experiment on dog.

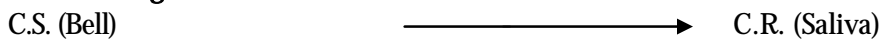
#### **Before conditioning**



#### **During conditioning**



#### **After Conditioning**



#### **Basic Terms used in classical conditioning:**

**Unconditioned stimulus (UCS):** Unconditioned stimulus is a type of stimulus that can always produce (or evoke) a response in an organism. This stimulus is capable to produce the response without any learning. In Pavlov's experiment meat was unconditioned stimulus because it could always produce saliva in dog.

**Unconditioned response (UCR):** It is an unlearned or natural response to unconditioned stimulus. In Pavlov's experiment salivation was unconditioned response.

**Conditioned stimulus (CS):** It is originally neutral stimulus that will produce a response only when it is repeatedly paired with unconditioned stimulus. In Pavlov's experiment bell was conditioned stimulus.

**Conditioned response (CR):** It is the learned response to the conditioned stimulus or the response given to conditioned stimulus. In Pavlov's experiment salivation to bell is conditioned response.

#### **Principles (or Laws) of Classical Conditioning:**

There are five basic laws of Classical Conditioning. They are:

- 1. Acquisition:** Acquisition is the process by which an organism learns new skill or stimulus response relationship. Acquisition can be defined as the process by which conditioned stimulus acquires the ability to elicit a conditioned response through repeated pairings of an unconditioned stimulus with the conditioned stimulus. In Pavlov's experiment the dog started salivating in response to ringing of bell after repeated pairing with meat. This is acquisition.
- 2. Extinction:** Extinction is the gradual disappearance of Conditioned response to conditioned stimulus. In other words extinction is the process through which a conditioned stimulus gradually loses the ability to evoke conditioned response. Extinction occurs when conditioned stimulus is no longer followed by unconditioned stimulus.
- 3. Spontaneous recovery:** A complete or permanent extinction is not possible. If C.S. is presented after a period of rest after extinction C.R. will reappear. This is called spontaneous recovery. In Pavlov's Classical conditioning experiment, after the occurrence of extinction, the bell produces few drops of saliva even in the absence of food.
- 4. Stimulus Generalization:** Stimulus generalization is a tendency for the CR to be aroused by a similar stimulus other than the conditioned stimulus. Generalization in conditioning occurs to a

then it responds to the other similar sounds of bells as it responded to original conditioned stimulus. This is generalization.

#### **5. Stimulus discrimination:**

Stimulus discrimination is the ability of organism to distinguish between a conditioned stimulus and stimuli other than conditioned stimulus. Though in the beginning mostly generalization in conditioning is found, the organism can be conditioned to make a response only to a specific stimulus by appropriate conditioning procedures. In classical conditioning the dog can be trained to salivate to one type of bell and not to other similar type of sounds.

### **IMPLICATIONS OF CLASSICAL CONDITIONING IN PRACTICAL LIFE**

There are various applications of classical conditioning. Some of the implications are mentioned below

**Controlling Behavior** Suppose an otherwise normal child wets the bed while asleep. The psychologist's problem here is to make the child more responsive to bladder tension, which is a **neutral stimulus** for awakening since it fails to awaken the child. The sound of a bell can be used as an unconditioned stimulus, since it always awakens the child. And a special bed pad can be employed that, when wet with urine, completes a circuit and sets on the bell.

In the early stages of conditioning, the bladder tension does not awaken the child; instead, the child urinates and is awakened by the bell. But eventually the bladder tension, which immediately precedes the bell, becomes a conditioned stimulus awakening the child before the sound occurs. Being awakened is a conditioned response to this tension.

*Similarly, when alcoholics are given to take alcohol containing a drug that produces violent vomiting, they develop aversion for alcohol. Thus, this method can also be used to treat alcoholic patient*

#### **In treatment of phobia:**

Classical conditioning believes that phobia is a conditioned response and a patient of phobia can be treated by use of classical conditioning. One therapeutic technique that uses the concept of classical conditioning to treat phobic patient is called systematic desensitization. In this method the therapist gradually and repeatedly presents the feared object to the patient while s/he relaxes. Because pleasure and pain can not exist simultaneously, the repeated pairing of feared object to pleasure (Muscle relaxation) results in gradual decrease in level of fear. Through this repeated process the patient loses fear of the object.

**Measuring Sensory Capacities:** Classical conditioning procedures are also used to assess the sensory ability of infants, some handicapped persons, and animals. In clinic for hearing and speech disorders, suppose an infant does not respond to certain sounds. How can we decide whether the child, too young to talk, has normal hearing?

If we gently prick the infant's foot and find that the leg is withdrawn, the pinprick is an unconditioned stimulus for leg withdrawal. If a bell is sounded in advance of the pinprick on several occasions, eventually the child with normal hearing withdraws the foot at the sound of the bell alone. We thus know that the infant's auditory mechanisms are functioning satisfactorily for this sound; some other factor must be causing its lack of response. There are, of course, certain constraints in using this procedure, but the success of the conditioning process apparently is not significantly related to the infant's age (Fitzgerald & Brackbill, 1977).

**The principle of classical conditioning has also been used in formation of attitude and changing attitude of people. In summary, classical conditioning has significant practical utility.**

### **OPERANT CONDITIONING (ALSO INSTRUMENTAL CONDITIONING)**

Operant conditioning refers to a kind of learning process whereby a response is made more probable or more frequent by reinforcement. B.F. Skinner (1940) postulated the theory of operant conditioning taking into account of Thorndike's theory of learning. Skinner named it as instrumental learning.

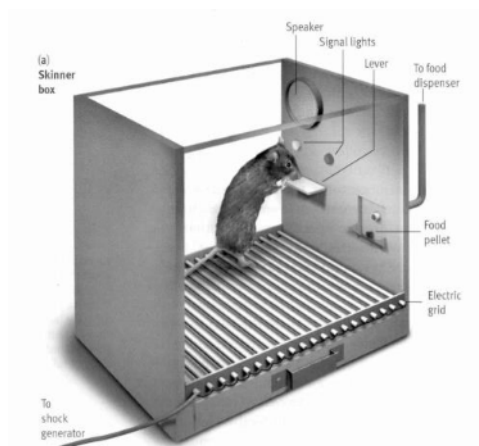
According to Skinner the organism shows some behaviors and these behaviors have some consequences i.e. either they are reinforced or punished. The behaviors that are followed by reinforcement are strengthened

Skinner used the term operant conditioning because this learning occurs while the learner is operating in the environment. Skinner emphasizes the fact that behavior operates upon the environment to generate consequences. Food, water, escape, freedom or some other rewards are known as consequences. Nature of consequence largely determines the probability of behavior to occur again.

The principal difference between Pavlov's classical conditioning and Skinner's operant conditioning is as follows. In classical conditioning there is an association between two stimuli, one of which automatically elicits the response and the other of which acquires this capacity. In operant conditioning there is an association between a voluntary response and its consequences in the environment.

### Experiment of Operant conditioning

The environment of the operant chamber used in the Bar Pressing experiment is controlled by lights and sounds. A hungry rat is put inside the small compartment of the box. The box has a lever which is mechanically connected with food. When a lever is pressed an electrical device releases a pellet of food into the food tray. The lever is connected to stylus for recording each and every movement of the lever pressing. Eventually the rat presses the lever that triggers the food-delivery mechanism, producing the food pallet. After gaining this outcome, the subject continues its apparently random activity, but sooner or later presses the lever again, obtaining another pellet. As time passes, the lever is pressed more and more frequently, and finally the rat consistently operates the lever to obtain a favorable outcome, in this case of food. Pressing the lever is very important because it operates the behavior and brings the reinforcement. If the animal fails to press the lever, no food comes.



A rat in a Skinner box, or operant chamber. When the animal presses the lever, a food pellet is delivered from the feeder. The delivery of a food pellet is contingent on the response of pressing the lever. The contingently delivered food pellets act to reinforce the lever-pressing response.

### Major phenomena of operant conditioning:

1. **Extinction:** If any response of organism is not followed by reinforcement, the tendency of it to occur again will decrease and finally extinguished. This is called extinction. Extinction occurred after several trials in which food no longer followed the lever-pressing response of rat.
2. **Spontaneous recovery:** It is the reappearance of learned response after extinction. When the rat was placed in same situation after some time after extinction of bar pressing behavior, the rat pressed the bar again. This is an example of spontaneous recovery.
3. **Generalization and discrimination:** Generalization is the tendency to respond to stimuli that were not present during original learning. A rat that has learned to press a certain lever may press a similar handle or bar, which demonstrates stimulus generalization.

Discrimination is the tendency to respond to stimulus present at the time of learning while not responding to other stimuli. By reinforcing only the press of the first lever and not a press of others, discrimination can be achieved.

4. **Reinforcement and Punishment:** Reinforcement or reinforcing stimulus is the stimulus that strengthens or increases the probability of response that it follows. There are two types of reinforcement i.e. positive and negative reinforcement. Positive reinforcement is a stimulus or

reinforcement. Example: If we give chocolate to children for homework, they will do homework next time to get chocolate (Reinforcement)

Negative reinforcement is the stimulus which when removed from a person's experience as a way to increase the likelihood of a behavior happening again. By use of negative reinforcement the organism learns to perform responses that permit them avoid or escape negative reinforcers. E.g. In an experiment on rat, it learned to press the button to avoid electric shock (Negative reinforcement).

Punishment or punishing stimulus is the stimulus or event that weakens or reduces the probability of the response that it follows.

### ***IMPLICATIONS OF THE THEORY OF OPERANT CONDITIONING***

Theory of operant conditioning has revolutionized the field of training or learning by bringing forward the following practical ideas and implications:

- a. The principle of operant conditioning may be successfully applied in the task of behavior modification. We have to find something which is rewarding for the individual whose behavior we wish to modify, wait until the desired behavior occurs and immediately reward the organism when he/she does. When this is done, the rate with which the desired response occurs goes up. When the behavior occurs next time, it is again rewarded, and the rate of responding goes up even more. Going in the same way, we will be able to make the individual learn the desired behavior.
- b. The task of the development of human personality can be successfully manipulated through operant conditioning. According to Skinner, "we are what we have been rewarded for being. What we call personality is nothing more than consistent behavior patterns that summarize our reinforcement history."
- c. Operant conditioning has also been used in education setting. To raise the performance of students teachers praise their students for regular homework and answering to questions in class. Similarly scholarships are granted for deserving students.
- d. Concept of operant conditioning has successfully been used to treat the patients in clinical situation. One therapeutic technique called *Token economy* has successfully been used to treat the behavioral problems of patients. In one such case the patients were helped to behave in a rational way in the hospital ward. The patients were given token for desirable behaviors such as washing, dressing, cleaning their room. The token could be exchanged for the things they desired. After some time the aggressive behaviors of patients were removed and they showed more desirable behaviors.
- e. Many companies are using the principle of reinforcement to increase productivity. They give bonus for good performance and regularity. Managers praise their staffs for those behaviors that enhance the good discipline in organization and that promote productivity.
- f. This principle can also be used in home setting. The parents who know the principle of operant conditioning can reinforce their children's appropriate behaviors and punish inappropriate ones and they can use generalization and discrimination techniques to teach which behaviors are appropriate in particular situation.

### ***Cognitive perspectives of learning:***

Cognitive perspective, also known as cognitive behavioral perspectives focuses on both external environmental condition and internal cognitive processes in determining learning process. These perspectives hold that human are not reactive being but proactive one. Their learning is thus not only the result of reinforcement and punishment. Rather, learning is guided by cognitive processes like intelligence, thinking, perceiving etc. two renowned models of cognitive perspective are social learning

## SOCIAL LEARNING THEORY (ALSO OBSERVATIONAL LEARNING / IMITATION LEARNING)

The social learning theory is developed by Albert Bandura and Richard Walter (1963). **Learning by observing or imitating others is called social learning.** Here the observer learns to make a response by watching others make that response. Many of our learning come from watching models, like parents, teachers, peers, motion picture and television performers. In order for the occurrence of learning, no direct reinforcement is necessary. Rather learning occurs through acquisition of knowledge and behaviors by observing the actions of other people and the consequences of those behaviors. This view is known a social learning.

Social learning generally takes place in a social situation. It involves a learner (imitator) and a model. The imitator observes the model. The imitator experiences the model's behavior vicariously. If the imitator observes that certain behavior on the part of the model is rewarded and "pays off", then the imitator copies that behavior. This is called "vicarious reinforcement".

Four factors are important in the occurrence of social learning.

- 1) **Attentional process** - The learner must direct his/her attention to appropriate model, that is, to other persons performing the activities. The model is not chosen randomly, rather it is chosen on the basis of attraction, possession of some desired attributes relevancy of the model's behavior to one's own goal and needs. Various internal and external factors play role in Attentional process.
- 2) **Retention process** -The learner must be able to remember what the model has done or said. It makes the person able to perform similar actions at later times.
- 3) **Production process** - The learner must be able to convert the memory representations into appropriate actions i.e. s/he must be able to produce the behaviors that the model presents.
- 4) **Reinforcement or motivation process** - The learner must be motivated to perform the observed behavior. With reinforcement the individual learns quickly and effectively.

These all factors have equal importance in learning by observation.

The four key factors in observational learning are shown in the following:

### **1. Attention**

The extent to which we focus on other's behavior.

### **2. Retention**

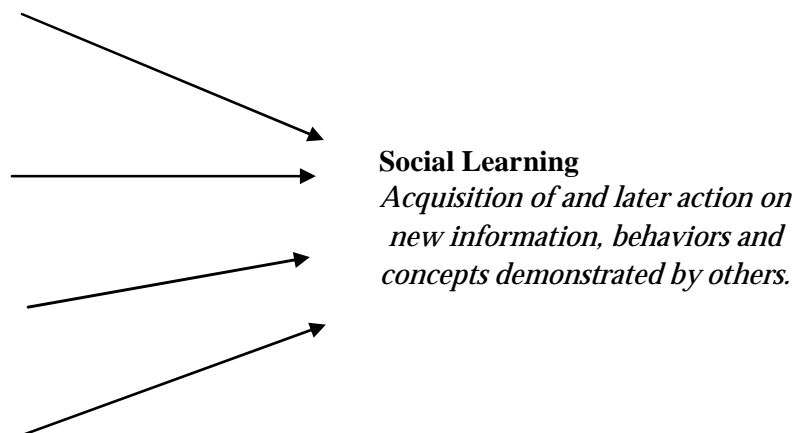
Our ability to retain a representation of others' behavior in memory.

### **3. Production process**

Our ability to act on these memory representation.

### **4. Motivation**

*The usefulness to us of the information acquired.*



## **Applications of social learning**

The influence of observational learning is evident in the clinical settings as well as in everyday settings. In clinical setting Participant Modeling is the technique that uses the concept of social learning. This technique is very useful in treating phobic patients. Modeling has also used to foster desirable behaviors in individuals. In everyday life several behaviors such as helpfulness, friendliness maybe developed through the social learning theory. This theory is also applicable in explaining the aggressive behaviors. Much of our aggressive behaviors are learned through observation. This fact has been verified by the fact that the children's whose parents are aggressive are more likely to show aggressive behaviors.

## **Insight learning**



situation are related or can be reorganized to achieve a solution. Higher animals like monkeys, Chimpanzees and adult human beings sometimes are able to bring the correct solution to a problem all of a sudden in contrast to slow, gradual process of trial and error. This sudden solution of problem in a single trial is called insightful learning. This type of learning is involved in higher animals while solving complex problems. Many inventions are based on this learning. Law of hydrodynamics of Archimedes is one example of insight learning. Kohler believed that we don't simply respond to stimulus but we actively engage to solve problems and while attempting to solve problems suddenly solution comes in mind. Though the learning is sudden, past experience, intelligence level etc. play important role in insight learning.

**The Experiment:** Kohler conducted various experiments on chimpanzee. One of the experiments conducted on chimpanzee is presented here. A hungry chimpanzee was kept inside a small room. A bunch of banana was hanging from the roof of the room and small boxes were kept inside. The chimpanzee took one box, climbed it to get the banana but failed. He tried and tried different boxes and finally got tired. After some time, the chimpanzee suddenly got the solution. Then he placed boxes on top of one another, climbed on it and finally got the bananas.

#### **Application of Insightful learning:**

We use insightful learning in solving many complex problems. Many times solving novel problems include insightful learning. Many scientific inventions including theory of hydrodynamics, invention of benzene, invention of tyre etc. were carried out through insight learning.



### ***Application of learning theories:***

**Shaping of behavior:** Shaping refers to a process of systematically reinforcing each successive step that moves an individual closer to the desired behavior. In other words shaping refers to a process of selectively rewarding behaviors in order to approximate the behavior with desired behavior. In shaping the organism receives a reward for each small step toward a final goal rather than only for the final response. At first the remote responses that may lead the organism toward desired behavior are rewarded and gradually the behaviors closer to the target behavior are rewarded. In this way organism learns complex responses. The essential feature of shaping is teaching a chain of simple responses leading to the final response. The final response is learned because the steps leading to it are reinforced. Behavior shaping can be made by use of reinforcing the behavior (positive or negative) that might lead to desired behavior and punishing the behavior that will not lead to the desired behaviors schedule of reinforcement.

#### **Methods of shaping behavior:**

##### **1. Extinction:**

According to operant conditioning, both good and bad behaviors are controlled by reinforced consequences. Identifying behavioral reinforces and removing them can decrease a behavior. An undesired behavior without reinforcement can diminish until it no longer occurs. This process is called extinction. Extinction can modify the behavior of a worker who spends much time talking or telling jokes. The attention of coworkers reinforces this behavior. If coworkers stop talking and laughing, the worker is likely to stop telling jokes. Although extinction is useful, it takes time to eliminate the undesired behavior. When behaviors need to stop immediately, one may resort to punishment.

##### **2. Punishment:**

Punishment consists of administering a negative consequence when the undesired behavior occurs. Punishment decreases a behavior, whereas negative reinforcement increases the frequency of a behavior. Punishment administers a negative consequence, whereas negative reinforcement removes a

### 3. Reinforcement

Reinforcement is the process that increases the probability that desired behaviors occur by applying consequences. Managers use reinforcement to increase the likelihood of higher sales, better attendance, or observing safety procedures. Reinforcement begins by selecting a behavior to be encouraged. Correctly identifying the behavior is important, or reinforcement will not lead to the desired response. A manager must decide if attendance at meetings is the desired behavior or attendance and participation. The manager would need to reinforce both behaviors if both are desired. Thus, a manager can shape behavior by using reinforcement and punishment. However, reinforcement is considered good for strengthening the behavior. For the result of reinforcement to be effective we should keep in mind the schedule of reinforcement.

#### *Schedule of reinforcement*

There are mainly two schedules of reinforcement. They are continuous schedule and partial schedule of reinforcement.

##### ***Continuous schedule of reinforcement:***

In continuous schedule reinforcement is given for every desired behavior or response. For example if a child receives chocolate every time he helps his parents for household the reinforcement can be said as continuous reinforcement. This type of reinforcement is useful for establishing or strengthening new behavior. However, extinction is quick once reinforcement is no more given.

***Partial reinforcement (intermittent schedules):*** If reinforcement is given in some instances and not in others for making desired behaviors this type of reinforcement schedule is called partial reinforcement schedule. Here the organism is not reinforced every time it makes a required response but only at times. Extinction is slow compared to the continuous schedule.

There are two types of partial reinforcement schedules:

1. **Ratio schedules:** In ratio schedule reinforcement is provided after the individual makes a certain number of desired responses. There are two kinds of ratio schedules
  - I. **Fixed ratio schedule:** In fixed ratio schedule reinforcement is provided after a specific number of desired responses. If a garment worker is paid with a voucher of 15 rupees after every 4 shirts sewn this is fixed ratio schedule. Fixed ratio schedule produces high, steady response rates with a slight pause in responding after each reinforcement.
  - II. **Variable ratio schedule:** In variable ratio schedule reinforcement is given after an unpredictable number of desired responses. If the worker is given voucher after first 5 shirts sewn, then after 9 shirts sewn, and then after 6 shirts sewn and so on this is variable ratio schedule. As the reinforcement is unpredictable this schedule produces high, steady response rates.
2. **Interval schedule:** If individual is reinforced for the first desired response after some time interval this type of reinforcement is called interval schedule of reinforcement. Interval schedule can be divided into
  - I. **Fixed interval schedule:** In fixed reinforcement schedule reinforcement is given for first desired response after some fixed time has passed, regardless of how many responses have been made during that interval. A fixed interval schedule produces a drop in responses immediately after reinforcement and a gradual increase in responses as the time for the next reinforcement approaches.
  - II. **Variable interval schedule:** In variable interval schedule, reinforcement is given for the first desired response after some time, but amount of time may vary. For example, rat might be reinforced for its first bar press after 19 second then after 37 seconds and so on. Variable interval schedule produce relatively slow, steady rates of responding, highly resistant to extinction.

Ratio schedule produces faster response rates than do interval schedule and variable schedules produce steadier response rates than do fixed schedules.

Employees' behavior in organizations can be modified. The modifications in behaviors of employees can be brought about by the application of a five- step **problem-solving model**. The model involves following steps:

**Step I -Identifying critical problems**

*An employee does several things in his/her job. But not all of them are equally important for the outcomes of his/her job. Therefore, the first step in organizational behavior modification (OB Mod) is to identify the critical behaviors that make a significant impact on the employee's job performance.*

**Step II - Developing baseline data**

The second step is to develop some baseline performance data. This is obtained by finding out the number of times the identified behavior occurs.

**Step III - Identifying behavioral consequences**

The third step is performing a functional analysis in order to identify the behavioral contingencies or consequences of performance. The analysis is done in order to find out why the behavior does/does not take place? What are the factors that cause the occurrence of the existing behaviors and what are the consequences of those behaviors. The analysis tells the managers why the behaviors occur and what factors are maintaining them.

**Step IV - Developing and implementing an intervention strategy**

After making the functional analysis come the development and implementation of the intervention strategies to strengthen desirable performance behaviors and weaken the undesirable performance behaviors. The strategy will require changes in the existing performance reward linkage, processes of job performance, technology etc. The goal is to make the high level performance more rewarding.

**Step V - Evaluating performance improvement**

*The final step in the OB Mod is to evaluate improvement in the performance alter the improvement strategies are implemented. It tells if improvement has occurred in the job performance.*

## Memory

We hear and see lots of information daily. If we are asked about the information later on, we can recall some of them. Such process of retaining information over time and recalling it at the time of need is called memory. According to Sdorow (1995) "memory is the process by which information is acquired, stored in brain & later retrieved". Thus, memory is the process of storing relevant information & recalling it at the time of need.

### Memory Process (or Memorization process)

Psychologists believe that human memory is analogous (Similar) to computer. As in case of computer, human Memory or memorization process involves encoding, storage and retrieval of information.

#### Encoding:

Encoding is the first process in memorization. It is the process through which information is converted into a form that can be entered into memory. Encoding include receiving sensory input & converting such information into a form or code which can be stored in brain. The sensory information is transduced or converted into neural impulses, which can be used and stored by brain. In addition to transduction, the encoding process also activates rehearsing, practicing or repeating the input. It also organizes into groups and relates groups to already stored information. Encoding may be automatic (that requires little or no effort) or effortful (that requires attention and conscious effort).

#### Storage:

Storage is the second process in memorization where encoded information is retained in the memory system often for longer duration. The information is stored in brain in form of neurochemicals called engrams or memory trace. The storage capacity of human brain is practically unlimited. According to one experiment, human brain can store upto 2 followed by 18 zeros bits of information. Different memory systems have different storage capacity and Long term memory works as a permanent storehouse for memory.

#### Retrieval:

Retrieval is the process through which information stored in memory is located. In other words, this process of bringing stored information into consciousness. Psychologists have distinguished three different ways of retrieving; Recall method, Recognition method and Relearning method. **Recall** is bringing past experience into present consciousness in absence of stimulus. Remembering name of friends, own birth date, answer to any question in examination are some examples of recall. **Recognition** is retrieving the information in the presence of the stimulus we have already experienced. In recognition we simply require sorting out the material among other material. Multiple choice question is an example of recognition method of retrieving. **Relearning** is the learning the information again. The speed of relearning the original material can test our memory.

### Memory Systems

Our memory can be divided into three memory systems according to their nature and purpose served. They are; sensory memory, short term memory and long term memory. These memory systems have their own role in memorization and work as complementary to each other.

#### **Sensory memory (or immediate memory):**

A memory system that retains sensory information (or input) for very brief period of time is called sensory memory. In sensory memory raw information (i.e. uninterpreted) is stored. Storage capacity of sensory memory is high and storage period ranges from fraction of second to 4 seconds. According to Bernstein (1997) there is separate register for each of the five senses and every register is capable of storing a relatively large amount of information.

Iconic sensory memory (Visual sensory memory) and echoic sensory memory (Auditory) are extensively studied by psychologists. Visual memory can store information up to 2 second while

### ***Short term memory:***

When information is attended and recognized it passes to another memory system called short term memory. This is the part of memory that stores limited amount of information for limited period of time. It is also called working memory because it enables people to do their mental work. It can store information from 20 to 30 seconds. Storage capacity of this memory is  $7 \pm 2$  chunks (or unit) of information at time. Loss of information from short term memory is mainly due to decay of information and displacement of older information by new information.

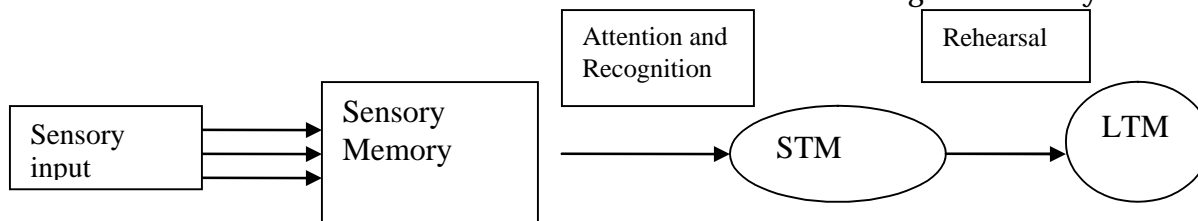
**Long term memory:** If information of short term memory is rehearsed, the information will pass to long term memory. Long term memory is the permanent storehouse for information. It can store practically unlimited amount of information. The duration of storage may range from hours to lifelong. Information loss or forgetting from long term memory is the result of various factors including Inhibition of information, Trace decay, Repression, memory dysfunctions (Like amnesia, dementia, fugue) etc.

### **Atkinson and Shiffrin model of memory (or Stage Model of Memory):**

One of the influential models of memory is Atkinson and Shiffrin model. This model believes that memory is a three stage process. This stage model can be described as below. The process of memory starts with a sensory register. Sensory information from various sensory channels is at first registered in sensory memory. Information is stored in sensory memory for very brief time. If the information of sensory register is not attended it is forgotten. If this information is attended & recognized the information passes to another memory system called short term memory (STM). Limited amount of information is stored in short term memory for few seconds. The information may be retrieved if necessary through short term memory. If the information is rehearsed (i.e. attention is focused on it) it passes to long term memory (LTM) where it is stored for relatively long duration. However, if the information is neither retrieved nor processed it is forgotten after certain interval.

When stored information is needed it is transformed from long term memory to short term memory and it is retrieved to consciousness.

Memorization model of Atkinson and Shiffrin can be illustrated diagrammatically as below



**Fig: Atkinson and Shiffrin Model of Memory**

### **Forgetting:**

Many times when we want to recall something we are unable to do so. This is what forgetting is. It is thus the inability to remember information that we need at a particular time. Forgetting can be defined as the apparent loss of information already encoded and stored in long term memory. Forgetting is normal phenomena. Not all forgetting is bad. However, many times we forget more than we think we should.

There are various reasons of forgetting. Some of the influential factors of forgetting are

1. Inhibition (or interference)
2. Repression
3. Trace decay

**1. Inhibition (or Interference):** Interference of information is one of the important factors of forgetting.

Inhibition refers to the tendency of new memories to impair the retrieval of older memories and vice versa. Thus, Inhibition may be of two types; proactive Inhibition and retroactive Inhibition. ***Proactive Inhibition*** is the type of Inhibition in which older memories interfere with the retrieval of newer information. Many times we give the old address and telephone number to other even though we have moved to new apartment. This is one example of proactive Inhibition. ***Retroactive Inhibition*** is the type of Inhibition in which new memories interfere with the retrieval of older memories. The name of new friend may sometime interfere our retrieval of one of old friends. Experimentally retroactive and proactive Inhibition can be illustrated as below.

Suppose there are two list of to be remembered material and there are two groups of individual namely; experimental group and control group. Now the proactive and retroactive Inhibition can be given as:

**Proactive Inhibition:**

***Experimental group***

Learns task A	Learns task B	Retention interval	Measure of Recall of B
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***Control group***

Rest	Learns task B	Retention Interval	Measure of recall B
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In this case interfering activity of learning task A comes before learning of the to- be-remembered items of task B. if there is proactive Inhibition, the experimental group will recall task B less well than will the control group.

**Retroactive Inhibition:**

***Experimental group***

Learns task A	Learns task B	Retention interval	Measure of Recall A
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***Control group***

Learns task A	Rest	Retention interval	Measure of Recall A
---------------	------	--------------------	---------------------

The difference between two group is the learning of task B. If the retroactive Inhibition occurs, the experimental group will do less well in recalling task A than will the control group.

Role of Inhibition increases with increase in similarity between to be memorized items.

**2. Repression (Motivated forgetting):** The term repression was coined by Sigmund Freud.

Repression is also called motivated forgetting or intentional forgetting. Freud believed that we have a tendency to have difficulty retrieving anxiety arousing or threatening information. This is why such information is pushed to unconscious mind through an unconscious mechanism called repression. This is the reason we forget shameful events and painful experiences of their life. As we can't recall the content of unconscious easily this becomes the reason of forgetting. He believed that we never forget the information. The only problem is that we can't retrieve it. Freud believed that these contents are expressed in form of dreams, slip of tongue etc. Such information can also be retrieved with the help of some specialized techniques like dream interpretation, hypnosis etc.

**3. Trace decay:** Many psychologists believe that forgetting is due to the decay of memory traces. They claim that learning results in neurological changes leaving certain types of memory traces or engrams in the brain. With the passage of time through disuse, these memory traces of learning impressions get weaker and weaker and finally fade away. This is the reason of forgetting. This theory suggests that simply passage of time and disuse of information is enough for forgetting of information. This is true to some extent but it can not explain why we don't forget our skills even after years of disuse like cycling.

long term memory. When there is appropriate retrieval cue memory is easily evident. Without appropriate retrieval cues we can't find to be retrieved information i.e. we forget such information. We can retrieve the information whenever we got the appropriate retrieval cue.

**5. Memory dysfunctions:** Memory disorders like dementia of Alzheimer's type, Amnesia (Anterograde and Retrograde), Fugue etc also cause forgetting. If the individual is suffering from these memory disorders s/he is likely to forget the things.

**A) Alzheimer's disease:** Alzheimer's disease (AD) is a slowly progressive disease of the brain that is characterized by impairment of memory and eventually by disturbances in reasoning, planning, language, and perception. It first involves the parts of the brain that control thought, memory and language. People with AD may have trouble remembering things that happened recently or names of people they know. Over time, symptoms get worse. People may not recognize family members or have trouble speaking, reading or writing. They may forget how to brush their teeth or comb their hair. Later on, they may become anxious or aggressive, or wander away from home. Eventually, they need total care. This can cause great stress for family members who must care for them.

Many scientists believe that Alzheimer's disease results from an increase in the production or accumulation of a specific protein (beta-amyloid protein) in the brain that leads to nerve cell death. AD usually begins after age 60. Some people may suffer from it in earlier age, even in their 35-40's. The risk goes up as the individual gets older. Risk is also higher if a family member has had the disease.

#### **B) Amnesia:**

Amnesia is partial or complete loss of memory. The loss of memory in amnesia can not be explained by normal forgetfulness. The individual may forget his name, age, his relatives, his residence etc. Amnesia occurs after physical or psychological trauma. Amnesia may be of two types i.e. Anterograde and Retrograde amnesia. **Anterograde amnesia** is a loss of the ability to create memories after the event that caused the amnesia occurs. This disease is usually acquired in one of two ways: Either it is drug-induced (benzodiazepines such as midazolam, flunitrazepam, temazepam, triazolam, and nimetazepam are known to have powerful amnesic effects.) or it follows a traumatic brain injury in which there is usually damage to the hippocampus or surrounding cortices. It can also be caused by shock or an emotional disorder. **Retrograde amnesia** is a form of amnesia where someone will be unable to recall events that occurred before the development of amnesia. Retrograde amnesia commonly results from damage to the brain regions most closely associated with episodic/declarative memory: the temporal lobes and especially the hippocampus.

**C) Fugue:** Fugue is actual flight from familiar surroundings. Apart from being amnetic, patient generally wanders away from his or her familiar surrounding. The individual may work like the normal individual in new surrounding but s/he has no memory of his past. After some time the individual finds him/ her in strange place. That is s/he knows nothing how s/he came to new place.

#### **Contemporary approaches to memory:**

In present time different memory modules have been presented. These include working memory module, Long term memory module (which include declarative module and procedural module) and associative module of memory.

considered passive. However, later researches showed that it was not passive but active one. That is why it was considered working memory or workbench of consciousness. The term working memory involves both storage capacity and the capacity to process information held in this memory system. This memory system can hold  $7 \pm 2$  chunks. One influential model has outlined how it processes. This model was outlined by Baddeley in 1992. According to this approach working memory carries out its action by help of three major parts i.e. phonological loop, visuospatial sketch pad and central executive. Phonological loop processes information relating to the sound of words. Visuospatial sketch pad processes visual and spatial information (i.e. information about the visual appearance of objects, such as color and shape and where they are located in space). Central executive supervises and coordinates the other two components. In this way working memory carries out its action via the action of these three major parts.

### **Long term memory Module:**

Long term memory module includes declarative and procedural memory.

#### **Declarative memory (or explicit memory):**

Declarative memory is the type of memory system that contains memories of facts. It is so called because it refers to memories that can be consciously discussed, or *declared*. This memory system can further be divided into semantic and episodic memory. **Semantic memory** refers to the memory of meanings, understandings, and other concept-based knowledge unrelated to specific experiences. In other words it is the memory system that stores general information about world or impersonal information. This memory system stores memories of rules, meanings etc. "The president of Nepal", " $E=mc^2$ " etc are for example stored in semantic memory system. Semantic memory is organized in terms of concept, prototypes (Abstract, idealized representation that captures an average or typical member of a category of things) and exemplar (an example of thing that is readily brought to mind).

**Episodic memory** stores personal information. This memory consists of specific things that happened to us at a particular time and places. When did I pass S.L.C., when was I graduated etc. are stored in episodic memory.

The primary contrast between episodic and semantic memory is that episodic memories are memories which can be explicitly described and stated, while semantic memory is concerned with concepts and ideas. For example, the concept of a table is stored in the semantic memory, but when someone describes his or her kitchen table, this is an episodic memory.

**Procedural memory (or implicit memory)** is the type of memory system that stores the information that we can't readily express verbally. All skill related informations are stored in procedural memory. For example the skills of cycling are stored in procedural memory.

### **Improving memory**

Educators and psychologists have devoted much time and effort to determine the factors that help or hinder the acquisition and storage of new materials. Some of the factors that help for improving memory are presented here.

**Mnemonics:** Mnemonics are special memory improving techniques. Some of the mnemonics are

- a) **Method of Loci:** The word "loci" means "places". This method is very important when we have to memorize a long list of items without consulting notes. In this method to be remembered things are associated with some familiar places or location. The place may be house, its room, college etc. The to be remembered items are visualized in such places.
- b) **Story telling method:** In this method to be remembered items are related to each other by method of creating a dramatic and interesting story. This method is very useful for remembering unrelated items to remember.
- c) **Acronym method:** Acronym is the method of creating combination of letters so that we



items are taken and some words are created. For example the acronym of SAARC country may be NIPBSABM.

*Overlearning, elaborative rehearsal, taking memory enhancing foods (vitamin B, C), following good sleep habits, doing regular exercise, managing stress are some other measures that may help in memory improvement.*

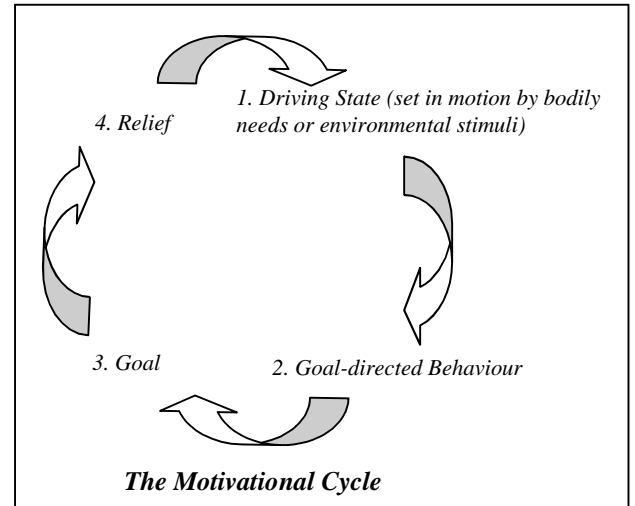
## MOTIVATION

The word motivation was derived from Latin word *Movere* literal meaning of which is to move. Thus motivation can be *defined as an internal process that initiates, guides and maintains goal directed behavior*. Motivation can also be defined as something that compels and energizes an individual to act or behave in a particular fashion at a particular time for attaining some specific goal or purpose. Motivation explains why an individual behaves in the way he behaves.

### The Motivational Cycle

Motivation is a cyclic process which starts with need and ends after satisfaction of need. The first step in motivation cycle is thus presence of need (or deficit). Need creates a state of heightened tension called drive. Drive pushes the individual to engage in goal directed activity to attain need. Drive maintains goal directed behavior in an individual until need is achieved. When goal is attained the individual gets relieved from tension produced by need. In this way motivation cycle is completed. Because human needs are unlimited, another need may arise after the satisfaction of a need.

Example- a hungry man.....



For types of motives class note has been provide – please check!

### Examples of key Secondary Needs

#### Need for Achievement

- Doing better than competitors
- Attaining or surpassing a difficult goal
- Solving a complex problem
- Carrying out a challenging assignment successfully
- Developing a better way to do something

#### Need for Power

- Influencing people to change their attitudes or behavior
- Controlling people and activities
- Being in a position of authority over others
- Gaining control over information and resources
- Defeating an opponent or enemy

#### Need for Affiliation

- Being liked by many people
- Being accepted as part of a group or team
- Working with people who are friendly and cooperative
- Maintaining harmonious relationships and avoiding conflicts
- Participating in pleasant social activities

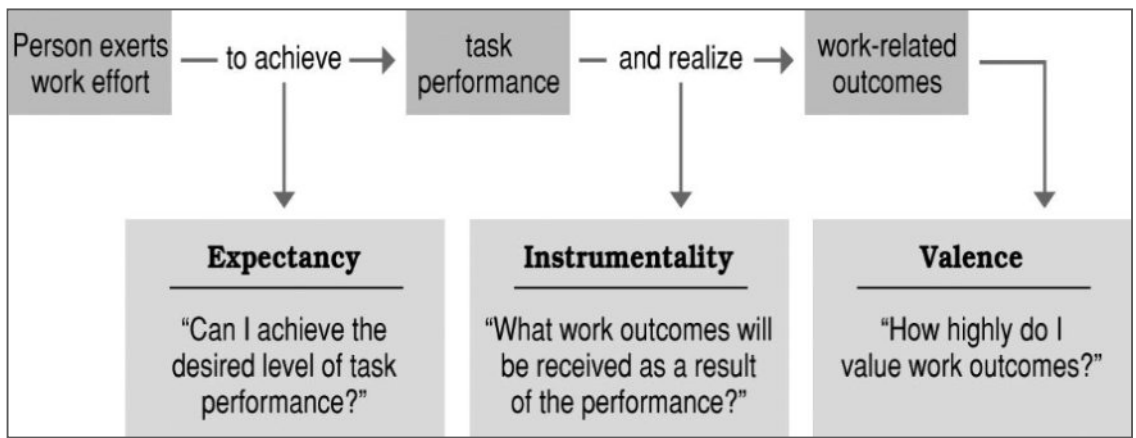
## THORIES OF MOTIVATION

Motivation process has been explained by different psychologists in somewhat different ways. Some of the common viewpoints of motivation are:

- a. Expectance theory or expectancy value theory
- b. Drive theory
- c. Goal setting theory
- d. Equity theory
- e. Arousal theory

## a) EXPECTANCY THEORY:

Various psychologists have proposed expectancy theory. Described here is the theory of Victor vroom. According to this theory work motivation is strongly affected by three



factors: Expectancy, valence and instrumentality. Expectancy is the belief of whether or not the particular goal is attainable. If expectancy is high work motivation will also be high. Instrumentality is the clearness in path. Instrumentality will be high if the employees have belief that doing certain tasks will certainly lead to the desired rewards. It is the perception of employees as to whether they will actually get what they desire which has been promised by a manager. Valence is the perceived value of the outcomes (or rewards) i.e. how much value the individual puts to the outcome. If he places high value to the outcome motivation will be high. Vroom suggested that an employee's beliefs about expectancy, instrumentality and valence interact psychologically to create motivational force such that the employee acts in ways that bring pleasure and avoid pain. This force can be calculated through following formula

Motivation (M) = Expectancy (E) × Valence (V) × Instrumentality (I)

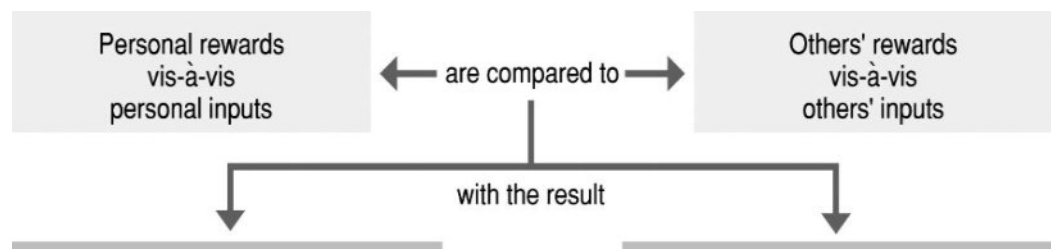
This formula clearly shows that motivation will be high only when all expectancy valence and instrumentality are high. Example - ???

## b.) GOAL SETTING THEORY

According to this theory motivation can be strongly influenced by our goals and goal related factors. This theory is very applicable for increasing the motivation of the employees which can be accomplished in several ways. The goal setting theory explains that:

- ✓ Fixing certain, specific, challenging goals for a given task often leads to better motivation and performance. Concrete stated goals often lead to an improvement in performance. Those people who have a specific goal in mind usually do better than those who are goalless. Simply saying 'do your best' will not be result oriented than setting specific goals, limiting to time bounds.
- ✓ Goals must be attainable, and realistic. Unreachable goals are likely to dampen the individual's morale, because people drop the idea to seek it and ignore it. For example, if a person wants to be a doctor but never passes the premedical exam, he or she will definitively change his or her future goal.
- ✓ Goals must be quantifiable in terms of measurement in percentage so that a vision of attainment and progress is sensed.
- ✓ Goals must provide feedback, as they give the degree of progress the employee is making towards his or her goal.

Remember the acronym – S.M.A.R.T GOALS (SPECIFIC, MEASURABLE, ATTAINABLE, RESULT ORIENTED, TIME BOUND)



This theory was proposed by Stacy Adams. This theory states that the perception of fairness is affected by the employee's comparison of outcomes they receive with their relevant inputs and also by comparison of his ratio with the ratio of other people. This perception of fairness in turn determines their work motivation. Work motivation will be high if equity occurs. Equity is a perceived fairness among socially equal status people through social comparison. If we perceive others as having more favorable ratios in the same background,

Inequity occurs if

Person's outcome/ Person's input < other's outcome/ Other's input

Or

Person's outcomes/ person's input > other's outcome/ other's input

This inequity in turn reduces work motivation. Equity occurs when

Person's outcome/ Person's input = Other's outcome/ other's input

Equity theory suggests that if we believe we are getting more than our input, in which we are over rewarded, we are less sensitive to it and describe the situation as deserving of these extra benefits. This situation is called self-serving bias. When the ratio of input is more than what the outcome is, the condition is under rewarded and a lack of motivation is likely to arise.

d.) **Drive theory:** This theory is also known as push theory of motivation. This theory suggests that behavior is pushed from within by drives stemming from basic biological needs. According to this theory biological needs arising within our bodies create unpleasant states of arousal or drive. This unpleasant state pushes us to engage in activities that reduce the drive state. Thus, motivation is basically a process in which various biological needs push us to actions designed to satisfy those needs and restore homeostasis.

*Follow same diagram as of motivational cycle – give example ?????*

e.) **Arousal theory:** Arousal is our general level of activation. According to this theory there is a certain optimum or best level of arousal (suited to our personal characteristics) that is pleasurable. People are motivated to behave in such a way as to achieve and maintain an optimum level of bodily arousal. If bodily arousal is lower than optimum level, they seek for the stimuli or situations that increase bodily arousal. If arousal is too high, behavior will be directed toward decreasing it. Studies show that too little arousal and we get bored; too much arousal and we withdraw, in an effort to lower our levels of arousal.

For instance – we have a very busy day in office where too many things are happening. We might feel like taking out telephone off the hook to reduce the overload of arousal. Or we are studying very easy subject matter, with very less arousal, then we tend to put on music or do other activities side by side to increase the level of arousal.

## **Thinking and problem solving:**

What a creative thinking! What are you thinking man? Are the common statements that we hear. Though it is very common term, it is hard to find common definition. Some psychologists consider thinking as problem solving behavior. Others consider it as sub vocal talking. Some consider it as the way in which we internally represent process and use information about world.

The most commonly agreed definition of thinking is *"It is cognitive rearrangement or manipulation of both information from the environment and the symbols stored in long term memory"*.

### **Elements of thinking:**

Thinking consists of three basic elements: Mental images, concepts and proposition.

*Mental images (Images):* Image is a representation that mirrors or resembles the thing it represents. Images are formed through all sensory modalities. If you are asked to draw picture of a cow you will use the mental image stored in mind.

*Concept:* Concepts are mental categories for objects, events, experience or idea that are similar to one another in one or more respect. Concepts distinguish between members and nonmembers of the conceptual category on the basis of specified characteristic and thus create basic categories of knowledge or meaning. Anger, cow sadness, fear are examples of concept.

*Proposition:* Propositions are units of meanings that are made up of concepts and that express a unitary idea. They join two or more concept. For example: Hari is good. In this sentence 'is' is proposition that connects two concepts Hari and Good.

### **Creativity:**

Creativity is the ability to go beyond present knowledge, resist the persistence of set and produce something new. Creative thinkers are the person's who can produce novel but effective solution to challenges. Creativity is a mental process involving the discovery of new ideas or concepts, or new associations of the existing ideas or concepts, fueled by the process of either conscious or unconscious insight.

### **Stages in creative thinking:**

Creative thinking involves five main stages:

- 1) *Preparation:* It is very first stage of problem solving. In this stage individual identifies the problem, gathers information and understands the problem. The individual also makes initial attempts to solve the problem. However,
- 2) *Incubation:* Occurs when the initial attempts to solve the problem don't succeed. In this stage thinker deliberately or involuntarily turns away from problem. He no longer marks consciously on the problem. However, unconscious processing may continue.
- 3) *Illumination:* If the thinker is lucky enough, the solution of the problem often appears suddenly. This is called illumination or 'Aha experience'. The insight of solution appears in illumination stage.
- 4) *Evaluation:* At this stage the apparent solution is tested to see if it satisfactorily solves the problem. If the solution appears to be unsatisfactory the thinker will again turn back to beginning. In other cases some modification or reinforcement are carried out.
- 5) *Verification:* When evaluation is carried out the solution is verified or confirmed. The solution indeed becomes a workable solution.

**Confluence approach of creativity:** Confluence approach formulated by Lubart (1994) suggests

Intellectual abilities: The ability to see problems in new ways, the ability to recognize which of one's ideas are worth pursuing and ability to convince others of these ideas.

Knowledge: Enough knowledge about the field in which the individual is working.

Certain Style of thinking: Which includes the ability to think in novel ways and think globally as well as locally.

Personality attributes: Certain traits of personality like willingness to take risks, tolerate ambiguity, intrinsically motivated and task oriented.

An environment that is supportive of creative ideas.

A high level of creativity emerges only when all of these conditions are present according to Lubart and others.

### **Problem solving**

A problem is any conflict or difference between one situation and another situation we wish to produce our goal. The term *problem-solving* refers to the mental process that people go through to discover, analyze and solve problems. Problem solving can also be defined as the effort to develop or choose among various responses in order to attain desired goals. In simple terms problem solving is the effort to solve problems. Usually thinking is initiated by problem and ends with a solution.

#### **Stages in Problem solving:**

According to Baron (2000), problem solving consists of four stages. They are:

1. Problem identification and understanding: This stage involves finding out what problem is, and figuring out what issues, and obstacles are involved. At this stage, importance of solving the problem is assessed and possible causes of problem are outlined.
2. Generation of potential solutions: At this stage various solutions to the problem are generated. This requires critical thinking about problem. The ability to generate solution depends upon our understanding of problem, information available and our past experience with problem.
3. Examination and evaluation of solutions: At this stage each and every alternatives is evaluated in terms of the outcome it will produce. The efficiency of particular solution and merits and demerits of using the solution are taken into consideration while evaluating the solutions.
4. Trying out of solution and evaluation of result: Finally, alternatives are actually tried out and evaluated on the basis of the effect they produce. The solution that is most effective becomes the solution of the problem.

**(Dear students: Make one example as mentioned in class and write it in each stage)**

#### **Methods of problem solving:**

According to Baron (2000), there are four major methods of problem solving. They are:

1. Trial and error: is a method in which a number of possible solutions are tried out until one succeeds. Many times it is all we can do. For example: we may hit each and every button to fire gun while playing videogames. This method is not effective method and

2. **Algorithms:** Algorithm is a set of rules which if followed correctly, will guarantee a solution to the problem. This is efficient because it guarantees solution to the problem. Example: Suppose you want to go to Nabil Bank. In such case if you dial 197 you will get the phone number and call there for location.
3. **Heuristics:** Heuristics are strategies, usually based on our past experience with problems, that are likely to lead a solution but do not guarantee a solution. They are shortcuts in solving a problem. Example: If you want to find a friend (Who does not have mobile), you may search him to possible places where he goes, but he may be there or not.
4. **Analogy:** Analogy is the application of techniques that worked in similar situation in past. This technique may or may not lead to solution. People have strong tendency to solve problem by this method. Example: If you have headache you may use cold water bath (because it relieved in past) to get relieve from it.

### **Factors affecting problem solving:**

**Functional Fixedness:** Is the tendency of individual to think of using objects as they have been used in the past. Functional fixedness prevents people from fully seeing all of the different options that might be available to find a solution.

Example: The American space agency NASA wanted to find a way for astronauts to be able to write notes in space. The trouble was that pens didn't always work upside down. After much research and millions of dollars, NASA eventually designed a pen that could be used in the space even if the astronauts were upside down. The Russians were also looking for the solution. What did they do? They used the pencil, and by doing so saved time and money.

**Mental Set:** A mental set refers to the tendency people have to only use solutions that have worked in the past rather than looking for alternative ideas. A mental set can often work as a heuristic, making it a useful problem-solving tool. However, mental sets can also lead to inflexibility, making it more difficult to find effective solutions. Example: There are six eggs in a basket. Six people take one of the each egg. How is it possible that one egg remains in basket? Many people find this problem hard to solve. It is because mental set makes them to think of six people taking the egg out of the basket. The answer is sixth person took basket as well as egg.

### **Decision Making:**

Human beings make decisions a number of times each day. They evaluate the pros and cons among various choices to reach a decision. Such process of weighing the advantages and disadvantages of each alternative to reach a decision is called decision making. Decisions are the choices made from among two or more alternatives. But we can not always make decision of our choice. We have to make decisions that are rational. Rational decision making implies making consistent, value maximizing choices within specified constraints. In other words, Rational decision making is a process which derives maximum utility and probability within certain limitations. Rational decision making model relies on a number of assumptions, including that the decision maker has complete information, is able to identify all the relevant options in unbiased manner and choose the options with the highest utility.

#### **Steps in Rational decision making:**

There are six main steps in rational decision making. They are:

1. **Define the problem:** The decision maker should at first define the problem clearly. He should be clear about what the problem is, what issues are attached with it.
2. **Identify the decision criteria:** At this stage the decision maker should be able to set the criteria for making decision. The set criteria should be scientific, standard and unbiased. The decision making depends heavily upon the decision criteria set.

allocate weight to each decision criteria depending on the importance, priority, need and available resources.

4. Develop the alternatives: The fourth step explains listing all possible alternatives with all available information. This is usually done by searching answers and practices that have worked well on similar problems. The decision maker may develop a new alternative, modify the existing one or try the existing one pointing the consequences of the alternatives.
5. Evaluate the alternative: Each and every alternative should be evaluated according to the criteria developed. The decision maker should analyze the right and wrong consequences assigning weights to the alternatives and choose the best with highest perceived value and probability of success.
6. Select the best alternative: The final step involves choosing the alternative which seems satisfying at the moment. Best alternative is chosen after judging all alternatives against each other, assigning weights and calculating the total value of the one which seems best.

**Dear students: Make an Example**

### **Common biases and errors in problem solving:**

Various biases and errors may be there in problem solving. Some of them are:

1. Over- confidence bias: It is said that "No problem in judgment and decision making is more prevalent and more dangerous than overconfidence". This is the tendency for people to be more confident than correct in their judgments. Studies have shown that when people answer multiple choice questions like, "Which is longer, the Mississippi River or the Nile River?", if the answers are 60% correct, the subjects are 75% certain of their answers. The research findings also indicate that individuals whose intellectual and interpersonal abilities are weakest are most likely to overestimate their performance and abilities.
2. Anchoring bias: It is the tendency to fixate on initial information, from which one then fails to adequately adjust for subsequent information. In other words Anchoring Bias is the tendency to rely too heavily, or "anchor", on one trait or piece of information when making decisions. It is also called Focalism. Example, a person looking to buy a used car - they may focus excessively on the odometer reading and the year of the car, and use those criteria as a basis for evaluating the value of the car, rather than considering how well the engine or the transmission is maintained.
3. Representative bias: Suggests that the more closely an event or object resembles typical example of some concept or category, the more likely it is to belong to that concept or category. Consider Linda, who is 31, single, outspoken, and very bright. She majored in philosophy in college. As a student she was deeply concerned with discrimination and other social issues, and she participated in antinuclear demonstrations. Based on this description, which you would say, is more likely: (a) Linda is a bank teller or (b) Linda is a bank teller and active in the feminist movement. Most people answer (b) because it matches their impression of Linda. But this is an error because it is not possible for the conjunction of two events to be more likely than one of the events alone. So (b) can never be more likely than (a).
4. Confirmation bias: confirmation bias (or confirmatory bias) is a tendency to search for or interpret information in a way that confirms one's preconceptions, leading to statistical errors. Confirmation bias is a phenomenon wherein decision makers have been shown to actively seek out and assign more weight to evidence that confirms their hypothesis, and ignore or underweight evidence that could disconfirm their hypothesis.



what is personally relevant, salient, recent or dramatic. Put another way, humans estimate the probability of an outcome based on how easy that outcome is to imagine. For instance, availability bias can result in our paying more attention to stocks covered heavily by the media, while the availability of information on a stock influences our tendency to invest in a stock.

6. Hindsight bias: Is the tendency to believe falsely, after an outcome of an event is actually known, that one would have accurately predicted that outcome. In other words, it is the inclination to see events that have occurred as more predictable than they in fact were before they took place. For example, researchers Martin Bolt and John Brink (1991) asked college students to predict how the U.S. Senate would vote on the confirmation of Supreme Court nominee Clarence Thomas. Prior to the senate vote, 58-percent of the participants predicted that he would be confirmed. When students were polled again after Thomas was confirmed, 78-percent of the participants said that they thought Thomas would be approved. The hindsight bias is often referred to as the "I-knew-it-all-along phenomenon."
7. Escalation of commitment: Is an increased commitment to previous decision making in spite of negative information. In other words, it is the tendency to invest additional resources in an apparently losing proposition, influenced by effort, money, and time already invested. Examples are frequently seen when parties engage in a bidding war; the bidders can end up paying much more than the object is worth to justify the initial expenses associated with bidding (such as research), as well as part of a competitive instinct.

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